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Protective
Structural
Decorative
Dialectric

Converting of Paper

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PAPER AIR STRIPS

(NEWS ITEM: A *new asphalt-treated paper and cloth surfacing material is replacing steel matting for emergency landing strips.*)

AAF engineers built and restored air fields in northern France using a new asphalt-treated paper and cloth surfacing material for landing strips. This material consists of a layer of cotton cloth sandwiched between two layers of heavy paper thoroughly impregnated with asphalt to make it waterproof. It can support planes as heavy as fighter-bombers.

Moisture-proof paper bags for ammunition . . . Absorbant paper for gas masks . . . Grease-resistant paper for food . . . Insulation paper for cables . . . New uses for paper, calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

Without interfering with the War Effort, research and development activities of The Pusey and Jones Corporation have continued. The war has accelerated many improvements in methods, materials, machinery and processes. It is the aim of our Research and Development Committee in studying these improvements, to incorporate as many of them as possible in our Paper-Making-Machinery.

The Pusey and Jones Corporation are now in a position to repair or modernize existing machine installations due to the lifting of restrictions by WPB. At present we are working on several modernization jobs. We have prepared three informative articles: "The Post-War Fourdrinier," "Development of the Stream-Flow Vat System," "The Flow Spreader." Ask for reprints by name.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
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Vol. 120, No. 1

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

January 4, 1945

Nekoosa-Edwards Co. Authorizes Mortgages

Stockholders At Special Meeting Vote To Issue $2,500,000 In Bonds To Retire Present Obligations and To Provide Capital For Expansion — Consolidated Co. Issues Report — Other Late Mill News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., January 2, 1945—A $2,500,000 mortgage on the plants and properties of the Nekoosa-Edwards Paper Company, Nekoosa and Port Edwards, Wis., was authorized at a special meeting of stockholders Thursday, December 21, in the company's offices at Port Edwards.

John E. Alexander, president, outlined a three-fold purpose: First, to retire the present outstanding obligations of approximately $1,250,000; second, to furnish additional working capital, eliminating bank borrowing; and third, to provide for expansion and improvement, and for additional raw materials.

The mortgage will take the form of a new 20-year sinking fund bond issue bearing average interest of 3% per year. It is to be underwritten by banks and insurance companies.

States Policy of Company

Stockholders were told that the policy of the company in recent years has been to increase production in the fine grades of paper and that in order to attain such objectives improvements in manufacturing facilities must be made. Among such projects would be the modernization and expansion of the bleach plant in the Nekoosa mill. Funds will be allocated to the Nekoosa improvements, involving plant enlargement, new equipment and machinery, but no time has been set, as the work will be done when conditions permit.

To carry out its program of converting to higher grades of paper, the company wants to purchase a permanent supply of pulpwood, especially spruce and balsam. A portion of the funds will be used to acquire considerable timber lands and stumpage. Locations were not divulged, as negotiations have not been completed. Nekoosa-Edwards already owns large tracts in Ontario and in Oneida County, Wisconsin, and other northern Wisconsin, Minnesota and Michigan areas where extensive reforestation and timber operations have been under way for some time, including company logging enterprises involving employment of 350 men in the woods.

To Form Special Products Dept.

Part of the newly-borrowed funds will be earmarked for establishment of a special products division, the purposes of which will be to provide the company with more converting papers for special products made of paper.

Mr. Alexander said that detailed information would be made public as soon as plans have been completed on any specific phase, but added that some of them would require a full year.

At the directors' meeting the same day a special dividend of 50 cents per share was authorized, payment to be made December 30. The regular dividend of 50 cents per share also was voted, bringing the total payment to $2.50 per share for the year.

In a separate yearend statement, Mr. Alexander reported a material increase in pulp mill operation, adding that the high paper machine operation practically paralleled the production of 1942-1943. He cited manpower problems, pointing out that more than 500 former employes are in the armed service. Difficulties in obtaining raw materials and operating supplies, he said, constituted a serious handicap to normal operations, but did not result in serious curtailment of production.

A labor shortage in the woods forced the company to buy rough wood, necessitating equipping both the Port Edwards and Nekoosa wood rooms with barking machinery. A new Kamyr wet machine was installed at Port Edwards.

A new 3,500 kilowatt Elliott non-condensing steam turbine played an important part, because of the low river flow during the last half of the year. Without it, full production might not have been attained.

Consolidated Co. Issues Report

Gross income from the sale of pulp and paper by the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., has been greater in 1944 than in any previous year, but tonnage and net profit were reduced, George W. Mead, president, declared in a yearend statement last week.

Properties have been kept in an excellent state of repair, and some important replacements and improvements were made during the year, despite the fact that vital materials and supplies in many instances were off the market or subject to high priorities, Mr. Mead declared, adding that the same obstacles existed in the procurement of raw materials.

"Spruce has become so scarce and there has been such a tremendous shortage of woods labor, that we have been compelled to resort to other grades of wood," he asserted. "We have purchased a large amount of poplar, which is obtainable in near localities. . . . We have given exhaustive scientific attention to its use until we are finally in a position to use poplar with success."

He pointed to the shortage of labor, saying that

(Continued on page 26)

Canadian Industry Is In Strong Position

High Wartime Demand For Pulp and Paper Results In Tighter Control By Government To Conserve Forest Products—Claims of Colonization Endanger Pulp and Paper Industry — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., January 2, 1945—While the New Year opens with the pulp and paper industry in the strongest position both strategically and financially in its history, the Old Year closed, as far as the province of Quebec is concerned, with widespread echoes of the note of alarm recently sounded by the Hon. John S. Bourque, provincial Minister of Lands and Forests, to the effect that at the present rate of consumption, the province is within measurable distance of the time when there will be no wood to feed the vast pulp and paper industry and the lumbering trade in general. This warning has been the subject of much editorial comment in the newspapers and of discussion in political and trade circles.

An immediate sequel has been action by the Government in tightening up the control exercised by the Department of Lands and Forests over cutting on Crown lands. A redrafted regulation has been promulgated providing that the forest engineer who prepares the sessional cutting program must be responsible for carrying it out, and must make a report after the cutting has been done showing that all the prescriptions of the working plan have been carried out. This post-cut report must be sent to the department within three months following the end of the forestry operations, which means between May 1 and July 31.

Conflicting Claims of Colonization

Another result has been to bring into sharp focus the conflicting claims of colonization and the lumbering industry in all its branches. As to genuine colonization, one benefit of locating in forest areas is that the new settler, in his woodlot, has the prospect of an immediate cash return through cutting his timber while getting his farm into shape. Formerly there was a drawback to this in that a lumbering company could continue cutting on the lot for a time, sometimes as long as 12 months, after the settler had arrived. This grievance, however, was removed in 1937, when the Government stipulated that once a lot had been conceded to a settler the company whose limits embraced that lot had no longer any cutting rights on the lot. With this grievance removed, expectation had been that there would be considerable impetus given to colonization, but the advent of war deferred such possibilities, though renewed impetus may be expected with the return of peace, especially in the matter of settling returned soldiers and others now engaged in war plants.

Danger to Pulp and Paper Industry

Here is where the possibility of danger to the pulp and paper industry occurs of extending colonization at the expense of forest reserves, and undoubtedly it was in view of this possible danger that the Minister of Lands and Forests, in giving his warning about exhaustion of forest wealth, announced that in future no outside cutting rights whatever would be allowed in areas set apart as forest reserves. The Minister said openly what has long been known, that the trouble with these reserves had been that members of the Legislature managed to secure special cutting permits from the department, ostensibly for colonization purposes, but with the net result, as is well known, that most of the wood got into the ordinary commercial channels. It was, in effect, another manifestation of the old false colonist game of getting the wood for nothing and selling it. Announcing the intention of the Government of putting an end to these abuses, the Minister said that detaching areas from the concessions granted to the companies had resulted in such companies having to go far afield in some instances for their raw material, and yet defeating the purpose of the Government in desiring forest reserves.

States Government's Position

Premier Duplessis, in a recent gathering in Quebec, said there need be no conflict between the colonist and the lumberman, and from hints that both he and the Minister of Lands and Forests have given of late, it would appear that there will be some important legislation on the subject of forests at the forthcoming session of the Legislature. The Government, said the Premier in effect, is seized of the fact that proper regulation of the forests means maintenance of the water powers and wild life of the province, upon which so much of the expected prosperity depends, since hunting and fishing will continue to form the basis of the tourist industry upon which the province is relying. He also made it plain that everything possible will be done to conserve forest areas so that the pulp and paper and lumber industries—by far the greatest sources of industrial employment in the province—may be assured of continuity of supply of raw material.

Prospects of Post-war Boom

"Canadian Business," the organ of the Canadian Chamber of Commerce, asking but not answering the question as to whether or not we are about to enter a cellulose age, points out the increasing attention being given to the production of pulp in Canada, and notes that while many new pulp products are in prospect the productive capacity of pulp mills, does not appear to be keeping pace with expanding demands for pulp. As to post-war prospects, it says that demand for both pulp and paper after the war should be sufficient to enable Canadian companies to operate at a high rate of capacity. Pointing out that Scandinavian countries will provide competition in Europe, and that Russia may be a growing factor as a producer, it says that the post-war demand from the United Kingdom is expected to prevent much Scandinavian pulp from reaching this continent. While new synthetic producers may be expected to enlarge the overall demand for pulp, it looks also to a large expansion in the consumption of newsprint with the establishment of a free press in Europe and the possible increase of advertising on this continent as companies seek to publicize their peace time production.

SPECIFY "GENERAL CHEMICAL"

for effective pH control and maximum sizing

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Muriatic Acid • Sulfuric Acid • Nitric Acid • Glauber's Salts (crystal or anhydrous) • Sodium Sulfide • Sodium Sulfite (anhydrous) • Sodium Bisulfite (solution or anhydrous) Sodium Hyposulfite • Salt Cake • Epsom Salt • Nitre Cake • Aluminum Sulfate (standard and iron free) • Crystal Alum, Potassium • Sodium Aluminum Sulfate • Sodium Silicate • Sodium Metasilicate • Trisodium Phosphate • Tetrasodium Pyrophosphate • Disodium Phosphate

TODAY more than ever, paper makers are insisting on General Chemical "Alum" in their operations because they can rely on its uniformity for maximum sizing and desired pH.

Careful attention to all production details plus constant laboratory control make General Chemical Aluminum Sulfate a product of high quality in its various grades. Specify "General" for your quality paper-making chemicals!

[redacted]

Standard—Lump; Ground 99% thru 8 mesh, 95% thru 10 mesh; Powdered 95% thru 100 mesh.

Iron Free—Lump approx. 2½"; Ground thru 8 mesh.

[redacted]

Solutions: from 38°—60° Baume. Wt. Ratio (Na_2O to SiO_2) from 1:2.00—1:3.40.

Appearance: Opalescent to clear.

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FOR AMERICAN INDUSTRY

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Chicago Reports Paper Items Very Scarce

All Major Types of Paper Are Tighter With Future Prospects Dim —Waste Paper Collections Drop—Salesmen Hold Party and Report Progress of Public Relations Plan — Other Late Market News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., January 2, 1945—Local paper trade executives are expecting a continued shortage of paper in 1945, with slim prospects of betterment during the last half of the year, and a continuation of price control as well as of stern and "realistic" War Production Board administration. The first condition, that of continued shortages, will force the latter two in the opinion of those who have been interviewed recently. The consensus of opinion seems to be that such controls will be much more helpful than harmful to the over all industry until such time as pent up demand can be brought back to some degree of normalcy and until the supply situation is considerably more bright than it is now. There are some who feel that price control will actually be an impediment to full speed production after the War is over but these are in the minority to those who, though agreeing on the long range effects of controls as regards production, believe that the market can get out of hand very easily unless carefully watched. There is also great interest in the OPA's reconversion price policies because of the effect they are certain to have on newspapers and paper products that will some day be on the market

It has been the worst month of all for so-called "military papers," according to local reports and sulphites, mimeos, groundwoods, map and specialty papers are universally in the same fix in being hard pressed to fill any consumer wants. Book and cover papers are also very scarce while krafts and board markets are virtually non-existent as far as civilian supply is concerned. Waste paper collections were held down by inclement weather though Chicago seems to be doing more than its part along these lines.

Salesmen Hold Christmas Party

The Western division of the Salesmen's Association of the Paper Industry held its regular Christmas party at the Hotel Sherman on Thursday evening, December 28 with Ben Babbitt of the Brown Company again acting as master of ceremonies to promote one of the "best Christmas parties yet."

As was the case last year, the military motif characterized the proceedings, yet even while there was a genuinely somber note in the background, the song leading of veteran Jim Coy, the impromptu stories of several veteran story tellers and the general good fellowship provided plenty of fun as well as serious business.

Only three military men were present, Colonel Dan Hardt, on leave from the Neenah Paper Company and top man in Manpower Commission circles here; Major R. E. Titus and Lt. Logan Miller of Fraser Industries, Inc., Colonel Hardt threw the only real "fear" of the meeting into the proceedings when he outlined the manpower shortages and jovially added that several of the boys present "looked pretty good to him."

Letters were read from the following members of the western division: (with all military titles omitted) who are now scattered all over the world in the service of their country: Ed J. Rolain, Mosinee Paper Mills; Bill Tilden, Mead Sales Company; Bruce McFarland, Port Huron Sulphite Paper Company—wounded and now in a hospital in England but expecting to get back to the States soon; Dave Brittain, Mead Sales Company; Robert Keats, Whiting Paper Company; Ford R. Kettle, Allied Paper Mills; Fred Leech, Neenah Paper Company and Bill Nash, Nekoosa-Edwards Paper Company and now hospitalized in Italy.

The letters, the news and the general tone of the communications helped to indicate the contribution of the industry to the real War effort and so show the whereabouts and activities of men who were among the most popular and energetic members of the SAPEYES during civilian days.

The crowd of nearly one hundred sales executives and guests also vigorously applauded vice president "Pat" Patterson's presentation of a fifty dollar war bond to Lou Ellis of the Northwest Paper Company for his excellent service as 1944 golf chairman—a job well done under exceedingly trying circumstances.

The western division members also again most thoroughly enjoyed the excellent piano playing of the team of Harold Pfister and Harry Kerr, two accommodating young men who have supplied some genuinely fine musical background for these parties for many years.

Report on Public Relations Plan

Three members of the western division of the Salesmen's Association of the Paper Industry are members of the six man Public Relations Committee of the national group, which recently made its report on the recommendations of the association in reference to bettering public relations. The three Chicago sales executives on the committee are Burt B. Fisher, chairman; Courtney Reeves and George K. Gibson. Coming in for major commendation was the action of the American Pulp and Paper Association in employing a public relations expert as the "first important step." The report also pointed out that the Salesmen were not interested in a "flamboyant and obvious consumer propaganda program" but rather in an "educational program designed to obtain and hold the goodwill of the American public" and the report also clearly indicated that the Salesmen's Association of the Paper Industry, representing a good cross section of the entire industry, was extremely hopeful that any public relations program would be of benefit to the entire industry, "the welfare of the paper industry as a whole." Over and above the practical results of such a program, the SAPEYES felt it would be of great value in unifying the industry into one with a common viewpoint and singleness of purpose "which would, alone, be worth the time and money spent."

New Sales Manager Appointed

The Universal Paper Products Company of Chicago has a new sales manager in the person of George L. Hudson who, it was reported last week, succeeds E. E. Smith.

Many factors govern the life and performance of wire cloth faces and winding wire.

One of them is the wire itself.

Well known and proved is the corrosion resistance of Monel to pulps, paper mill stocks and white waters, caustic liquors and cleaning solutions of dilute muriatic and sulfuric acids.

Of equal importance is that Monel wire faces and winding wire are combined *safely* with bronze cylinder parts under corrosive conditions generally met in stock preparation.

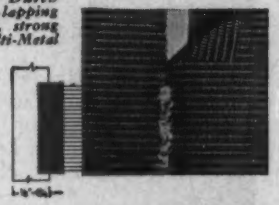
Add to those qualities a rigidity almost twice that of bronze . . . add high strength, and resistance to abrasion and wear . . . and you have the reasons why mills report up to 10 years of continuous performance for Monel on washers, thickeners, cylinders and filters. And remember that Monel wire cloth is *lowest* in cost among wire cloths of comparable high strength and corrosion resistance.

For further information on Monel wire cloth, write for your copies of *Performance and the Reasons* and Bulletin C-3, *Monel, Nickel and Inconel in Pulp and Paper Mills.*

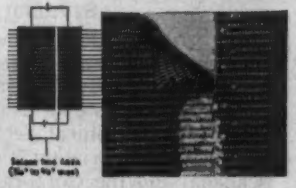
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

Monel

Seams for Monel faces are readily made by silver soldering or welding. This improved butt joint for corduroy and twilled Dutch weaves eliminates over-lapping and produces a smooth, strong seam. Developed by Multi-Metal Wire Cloth Co.



1 ¾" x .014" Monel strip spotwelded to under side of one end, ½" to project.



2 Bring cover around to close fitting butt joint. Solder cloth to Monel strip and over butt joint.

ESTABLISHED TYPES OF MONEL WIRE CLOTHS for PULP and PAPER MILL SERVICES		
Pulp Thickeners	*Monel Backing Screens*	*Monel Top Screens*
VACUUM FILTERS	10, 12, 14 mesh*	40, 50, 60 mesh
SAVE-ALLS	10, 12, 14 mesh*	50, 60, 70, 80 mesh (12 x 64 corduroy cloth used without backing screen)
Unbleached Stock Washers		
VACUUM FILTERS	10, 12, 14 mesh*	30, 40, 50, 60 mesh
DECKERS AND CYLINDERS	12 x 64 mesh Monel and 14 x 88 mesh Monel corduroy cloth used without backing screen	
*Alkaline Bleached Stock Washers***		
VACUUM FILTERS	10, 14 mesh*	40, 50 mesh
BOARD MACHINE CYLINDERS	10, 12, 14 mesh	30, 40, 50, 60 mesh
BEATER WASHER		40, 50, 60 mesh
Lime Sludge Filters VACUUM TYPE	14 x 100 mesh Monel, 24 x 110 mesh Monel, 200 twilled Dutch weave Monel and "AU-Type" extra heavy braided weave Monel filter cloth	
Water Filters CYLINDER AND VACUUM TYPE	12 x 64 mesh Monel, 14 x 88 mesh Monel 80 mesh twilled Monel (wire dia. 0.007") 100 mesh twilled Monel (wire dia. 0.005") 120 mesh twilled Monel (wire dia. 0.004") 120 x 140 mesh twilled Monel (wire dia. 0.004")	
CLAY AND COLOR STRAINERS	150, 200 and 325 mesh Monel	

*10 mesh recommended for increased open area and drainage—**For chlorinated, acid-bleached stock washers Type 316 nickel-chromium-molybdenum alloy steel recommended.

This classification table is offered for your guidance through the courtesy of the Multi-Metal Wire Cloth Company, N. Y. *Write us for copies.*

Obituary

H. Maxwell Howard

MIAMI BEACH, Fla., December 31, 1944—H. Maxwell Howard, paper company executive and nationally known owner of race horses, among them Stagehand, highest money winner of 1938, died here today in a hospital.

Born in Lebanon, Ky., Mr. Howard lived most of his life in Ohio. His home was in Dayton, but he passed each winter at his home here.

Mr. Howard made a fortune in paper mills which permitted him to indulge freely in his hobby of horse breeding and racing. His first paper mill was the Aetna Paper Company, organized in 1897, followed twelve years later by the Howard Paper Company, Urbana, the Maxwell Paper Company, Franklin, founded in 1927, and the Dayton Envelope Company, Dayton, 1932, all in Ohio.

Mr. Howard's wife, who was the daughter of H. H. Hoffman, financier, of Cincinnati, died in 1929. Their son, Howell Howard, treasurer of the paper companies headed by his father and a well known polo player, died from injuries suffered in a polo accident in 1937.

A daughter, Mrs. Chester L. Dane, of 720 Park Avenue, New York City; two brothers, Lucius S. and Ward Howard, both of Urbana, and two sisters, Mrs. Emmogene Beckman, Lebanon, Ky., and Mrs. Juliet Spier, of Glens Falls, N. Y., survive.

Seymour J. Fisher

MONTREAL, Que., January 2, 1945—Seymour J. Fisher, general superintendent of the River Bend plant of Price Brothers and Company, died during the holiday season, in his 65th year. He was a member of the Technical Section of the Canadian Pulp and Paper Association, the Engineering Institute of Canada, and the Corporation of Professional Engineers of Quebec Province.

Born in Halifax County, N.S., Mr. Fisher, son of a Methodist clegryman, was educated at Mount Allison University and at McGill University where he graduated in mechanical engineering in 1910. For several years, he was sales and service engineer for Babcock-Wilcox Company here and during the last war served on the Imperial Munitions Board at Ottawa. He later worked at Brockville, Ont., then joined the staff of the E. B. Eddy Company, Limited, and still later became operating manager of the Lake St. John Power and Paper Company, Limited, at Dolbeau, Que., a position which he left in 1931 to become general superintendent at River Bend.

James T. Mix

James T. Mix, for thirteen years sales representative for the Great Northern Paper Company, newsprint manufacturers with offices at 342 Madison avenue, New York, died January 1 at his home, at 17 East 97th street. He was seventy-eight years old.

Mr. Mix had been employed in the paper business since he was eighteen years old, first working for the George H. Taylor Company, in Chicago. Later he worked for the International Paper Co., 202 East Forty-second street, New York; Price Brothers & Co., Ltd., in Quebec, Canada, and the Northwest Paper Company in Cloquet, Minn.

Surviving are his wife, Mrs. Helen C. Mix, and a daughter, Miss Margaret H. Mix.

Charles Addoms

Charles Addoms, chairman of the board of directors of the Miller & Wright Paper Company, 200 Varick street, New York, wholesale paper concern with which he was affiliated for fifty years, died December 26 in St. Vincent's Hospital, Seventh avenue and Eleventh street. He was seventy-five years old and lived at 1 Fifth avenue.

A native of San Francisco, Mr. Addoms joined the Wright Paper Company as an accountant in 1894. He was elected vice-president and treasurer ten years later and served in that capacity until 1942, when he was named president and treasurer. Last November he was elected chairman of the board.

He was a former president of the National Paper Trade Association and former president and treasurer of the Paper Association of New York City.

Surviving are his wife, Mrs. Sarah E. Addoms; two daughters, Mrs. Rodney Hume and Mrs. Robert Lockwood; a son, Robert Addoms; a sister, Miss Jessie Addoms, and a brother, Dr. Louis Addoms.

E. T. Fleming

E. T. Fleming, 72, of Dallas, Tex., pioneer in the paper mills industry, who in forty-six years built the largest such concern in the Southwest, died on Christmas morning in a Dallas hospital.

Mr. Fleming came to Texas from Oregon as a boy and grew up in the paper mills industry, later founding the present Fleming Paper Mills which he operated and directed into successful channels. Associated with him in recent years, were his two sons, E. T. Fleming, Jr., and John G. Fleming.

Besides his two sons, Mr. Fleming is survived by his wife and one daughter, Mrs. Clark Watson.

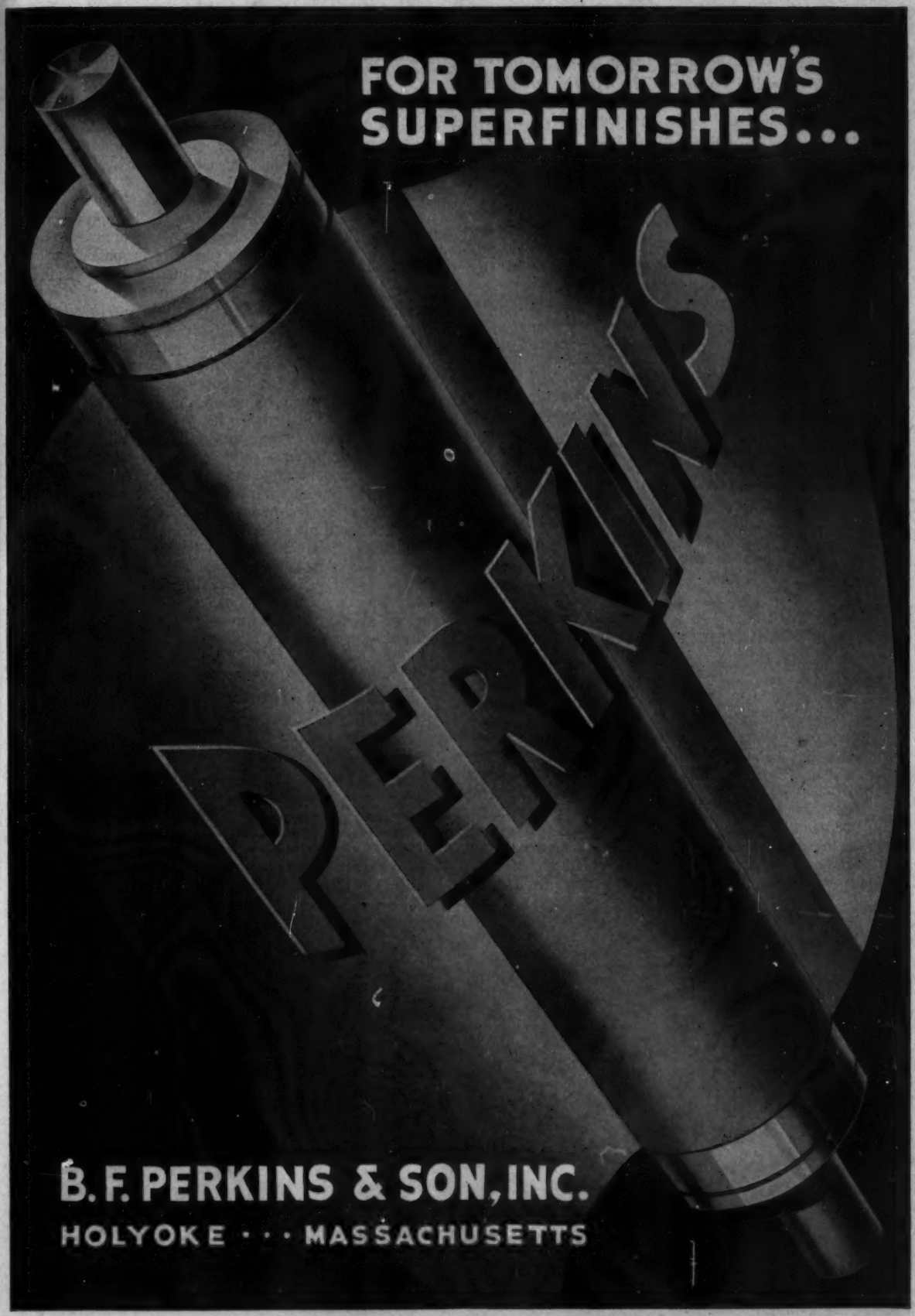
New Dust Collector

Manufactured in four sizes, the Dustex portable dust collector is designed to meet the need for an efficient and economical means of removing from the air dangerous and obnoxious dusts arising from industrial operations such as lint, shavings, grindings, etc. It is built by the Dust Filter Company, 4418 N. Clark street, Chicago 40, Ill.

The principle underlying the unit is the compound action on the air-borne dust, first by centrifugal separation from the air stream and second, by impingement on the filter surface. Maintains constant static air suction of more than 4" at velocity of over 5000 LFM. This means more dust collected quicker. Completely fireproof. Units weigh from 75 to 200 pounds; are 30 to 51 inches high.

The Dustex separator successfully collects the most minute dust particles. Filter assembly consists of two corrugated layers of wire mesh covered with 60-mesh filter cloth. Filtered air is discharged through muffler to deaden air noise with but minimum resistance back into the room.

Use protects valuable equipment from abrasive or corrosive dusts; improves employee efficiency, comfort, morale and health by providing cleaner and more healthful working conditions.


FOR TOMORROW'S
SUPERFINISHES...
PERKINS
B. F. PERKINS & SON, INC.
HOLYOKE · · · MASSACHUSETTS

Harris, Seybold Divs. Get Army-Navy E

The Harris-Seybold-Potter Company, whose home offices are in Cleveland, received Army-Navy "E" awards for both its plants. The Harris Division at Cleveland received its "E" on December 11, and the Seybold Division at Dayton on December 12. Both divisions of the Company are turning out war goods at a high capacity—far in excess of their normal volume of peace-time production.

R. V. Mitchell, Chairman of the Board of the Company, was Master of Ceremonies at both presentations. The Army-Navy "E" flag was presented to both divisions by Commander C. O. Triebel, U.S.N. Commander Triebel has spent many years in submarine service, and has been awarded the Navy Cross, Gold Stars in lieu of Second and Third Navy Crosses, the Silver Star Medal, and the Gold Star in lieu of the Second Silver Star Medal.

A. S. Harris, President of the Company and son of one of its founders, received the award for the Harris Division. N. O. Scourfield, Manager of the Seybold Division, received the award for the Dayton plant.

Major Harry Stair, U.S.A., Provost Marshal for the 2nd Area, Fifth Service Command, presented the "E" pins at the Haris ceremony to Joseph O. Jones, John Kickel and Edward Waldeck on behalf of the men and women of the plant. Major W. W. Harkinson, U.S.A., Army Air Force, Wright Field, presented the pins at Seybold, which were received by Max Conklin, Walter Eichman and Alois Koehler.

Howard Whittemore Honored at Dinner

A dinner party was given to Howard Whittemore, president of Parsons & Whittemore, Inc., Monday evening, November 27, 1944 at the Hotel Biltmore on the occasion of his 80th birthday. Officials and employees of Parsons & Whittemore and its affiliate, Lyddon & Co., were present, as well as Boris Danneman, manager of Lyddon y Cia., Ltda, of Sao Paulo, Brazil.

Cocktails were served before dinner and corsages of gardenias were provided for the ladies. In keeping with the festive occasion the table was artistically bedecked with chrysanthemums and ferns. Several appropriate, but nonetheless witty, speeches helped, in a great measure, to make the evening an enjoyable and successful one.

Karl F. Landegger, executive vice-president, acted as toastmaster and, after proposing a toast to the health of the honored guest and presenting him with a gold pen, called upon the first speaker, J. Francis Strub. Mr. Strub eloquently traced the history of the company and outlined the guest of honor's career. The tale, as it unfolded, was dramatically interjected with concurrent historical events.

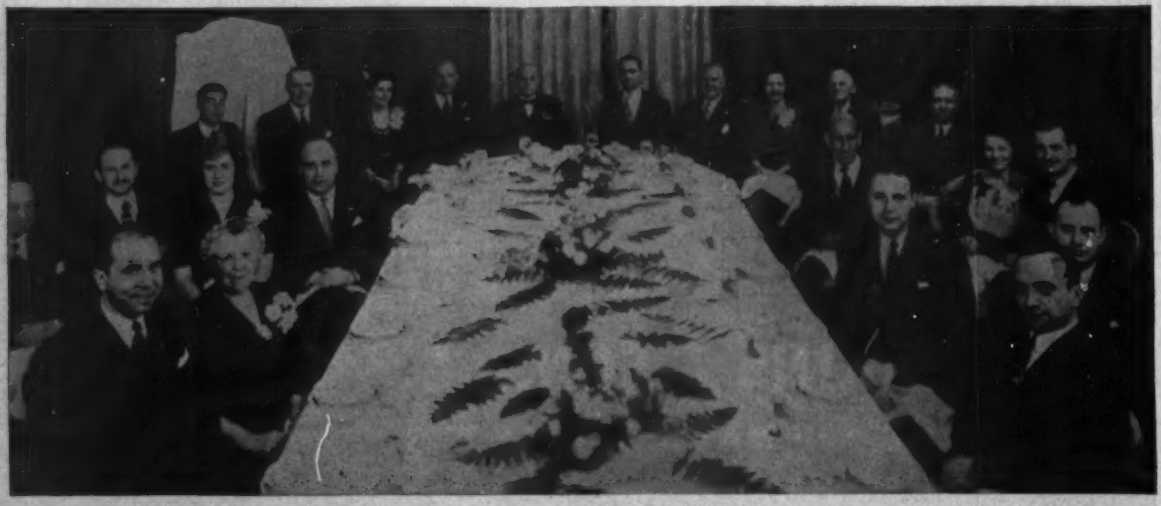
Though incorporated in 1908 P & W's antecedents date back to 1853 when Wm. H. Parsons I made his auspicious but humble start as a paper merchant. In later years he and his partners branched off into other levels of the industry and as early as 1858, with the "laying of the first Atlantic cable," the firm entered the export field. Howard Whittemore joined the company in 1900, then known as Parsons Brothers, and soon became a partner in charge of sales in Central and South America and in real pioneer fashion toured those countries. Parsons & Whittemore, since its inception, continued the fine traditions established by its predecessors enhancing its world-wide reputation as one of the leading exporters of paper.

As is the custom at such parties, Mr. Whittemore performed the ceremony of cutting the first piece of birthday cake, following which he delivered a short address, thanking those present for their participation and efforts. He concluded by wishing the new managment success in the perpetuation of P & W.

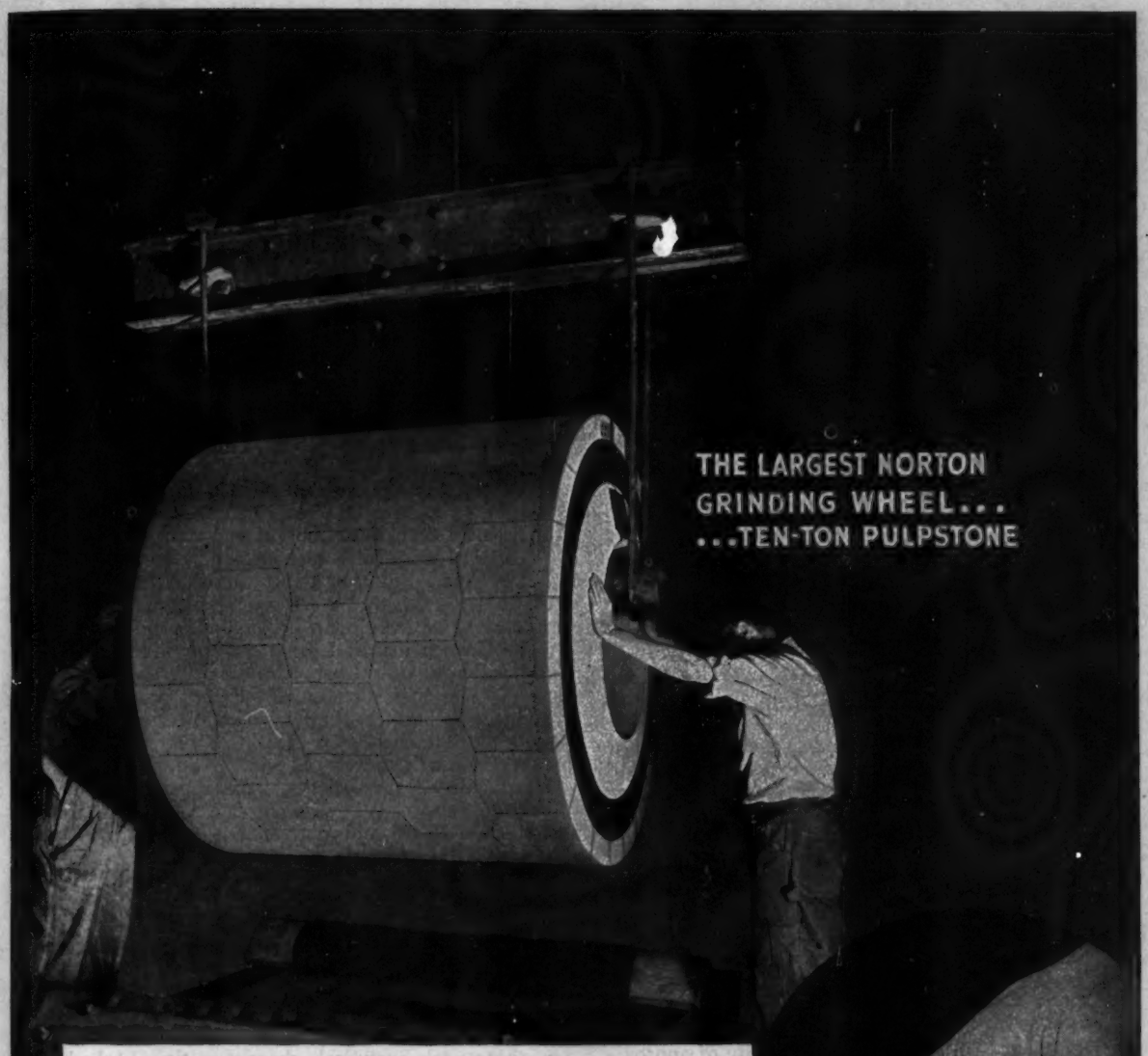
The highlight of the evening came with the presentation, by Robert Grant, of a bronze plaque inscribed with a testimony of Mr. Whittemore's unswerving devotion to the interets of the company here and abroad.

To Manage Hooker Sales Development

The Hooker Electrochemical Company announces the appointment of John S. Coey as manager of its Sales Development Department at Niagara Falls, N. Y. Prior to this promotion, Mr. Coey was an assistant in this department. In 1937 he joined the Hooker technical staff in charge of the Process Study Group working on the improvement of processes and products. A graduate chemist from Amherst College, Mr. Coey is well equipped to give technical assistance to the chemical industries served by Hooker.



PICTURE TAKEN AT 80TH ANNIVERSARY DINNER TO HOWARD WHITTEMORE



NORTON GRINDING WHEEL DIVERSITY

Norton produces grinding wheels up to 48" diameter in the ordinary course of manufacturing—segmental grinding wheels —pulpstones—up to 6' diameter. Diamond wheels and mounted points as small as 3/32" diameter. Making a wide range of sizes as well as innumerable grits, grades and bonds and a variety of structures is part of the Norton business, to supply you with the exact abrasive for your production requirements. Norton abrasive engineers will help you to get top grinding production all the way from pulpwood to the hardest steel alloys.

Norton Company, Worcester 6, Mass.

Behr-Manning, Troy, N. Y., is a Norton Division

THE SMALLEST NORTON
GRINDING WHEEL...
...ONE OUNCE

NORTON ABRASIVES

Produces Chemical Equivalent of Distilled Water

Ordinary water can now be transformed into the chemical equivalent of distilled water by a simple filtration process developed by American Cyanamid and Chemical Corporation, 30 Rockefeller Plaza, New York, and made available in portable stationary equipment designed for all types of users.

With these units, trade-marked Filt-R-Stil, water which is virtually mineral-free is made readily accessible for research laboratories; in electronic and electrolytic equipment fabrication; in the manufacture of textiles, leather, paper, pharmaceuticals, food, dyestuffs, and many other products, as well as in the filling of storage batteries.

The principle of the Filt-R-Stil is one of filtration by skillful utilization of melamine-derived and other resins, developed by the American Cyanamid Company. Water is passed through beds of these ion exchange resins which transform the dissolved salts in the water to the corresponding acids and in turn absorb the acids. The process may be visualized by picturing water as containing flowing metals which are attracted by a magnet except that the magnet, in this case is chemical rather than electrical.

The Filt-R-Stil is made in different sizes and capacities to meet various requirements. The small portable unit is made in two forms, one for field and the other for bench use. The field unit, designed primarily for use by the Armed Forces, supplies demineralized water for storage batteries and for electronic equipment where water free of dissolved salts is essential to make it a perfect insulating medium. The bench unit is designed for use in filling stations, drug stores, photographic studios, chemical laboratories, and similar applications.

The capacity of these small units is eight to ten gallons of demineralized water per hour. They are equipped with cartridges of ion exchange resins, which are renewable when exhausted, in much the same way as flashlight batteries are renewed. An automatic shut-off or warning device on each unit indicates when renewal of the cartridge is necessary.

The Filt-R-Stil Lab unit has a capacity of approximately thirty gallons per hour. It is designed for the larger chemical and research laboratories, hospitals, and other users where moderately large quantities of demineralized water are needed. The operation of the laboratory unit differs somewhat from that of the portable unit. In place of a cartridge, there are four beds of alternate cation and anion exchange resins in pyrex glass columns connected by an intricate piping system. As the water passes over the first bed, dissolved salts are transformed to the corresponding acids. These acids are absorbed on the second bed. The third bed picks up any dissolved salts which have leaked through and the fourth absorbs the remaining acids as well as removing the carbon dioxid.e.

Waste Paper Men Pledge Support

The OPA Waste-paper Industry Committee for New York City, met today and pledged its full support and cooperation, Daniel P. Woolley, Regional OPA Administrator announced. It was indicated that the committee may be enlarged in the near future. James P. Flannery of James P. Flannery Company was elected secretary.

Name Curtis Hutchins Chairman

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., January 3, 1945—Curtis Hutchins, of Bangor, Me., chief of the Pulpwood Branch of the War Production Board Paper Division, has been designated chairman of the Coordinating Committee on the Farm Production of Forest Products, Benton Cancell, deputy director of the WPB Forest Products Bureau, announced today.

In making the new appointment, Mr. Cancell pointed out the contribution members of the Coordinating Committee and their respective organizations have made in stimulating timber production by farmers. He said that farmer production has made it possible to maintain the needed level of such critical materials as pulpwood. lumber, naval stores and container stock. The continued efforts of farmers on an even greater scale are needed if we are to meet our 1945 requirements for essential forest products, Mr. Cancell said.

Mr. Hutchins succeeds M. H. Collet, of the Paper Division, who has been chairman of the committee for nearly a year. Mr. Collet is resigning his position to return to his former post as forest engineer of the West Virginia Pulp and Paper Company, New York. Albert Hall, of the WPB Lumber Division, will continue as vice-chairman of the committee.

The Government and private agencies represented on the Coordinating Committee are: Periodical Publishers' National Committee, Farm Press Forest Products Committee, the Extension Service, and the Timber Production War Project of the Department of Agriculture; Forest Service, National Lumber Manufacturers' Association, farm organizations, Selective Service, War Manpower Commission, War Production Board and War Activities Committee of the Pulpwood Industry.

Commercial Methods of Analysis

The McGraw-Hill Book Company has just issued another book in its International Chemical Series. This is Commercial Methods of Analysis by Foster Dee Snell and Frank M. Biffen (700 pp. 5½ x 8½). Although many meritorious texts have been published on theoretical analytical chemistry this book has another purpose, namely to show the method of approach to analysis of the innumerable complex commercial products on the market today. Many of these are colloids, some are emulsions that may contain a a half dozen ingredients besides water and oil, a majority contain organic as well as inorganic ingredients, and as unknown samples most of them would present problems extremely difficult of solution by the inexperienced chemist.

There is a chapter on paper, paper fibers, textile fibers and starches. This contains several methods of the Technical Association of the Pulp and Paper Industry, together with practical modifications for quick testing. Other subjects covered include micro and spot test analysis, hydrogen-ion determinations, water analysis, metals, soaps, cements, fats and oils, lubricating greases, waxy substances, solvents and thinners, paints, lacquers and resins, synthetic resins, pigments, mineral fillers, rubber, coal, gases, sugars, petroleum products and the preparation of special test solution.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd street, New York 17, N. Y. at $6.00 per copy.

H. W. Butterworth & Sons Co.

announce

the acquisition of

The Textile Finishing Machinery Co.

Providence, R. I.

The Providence plant will
operate as a Division of
the Butterworth Organization

Executive Offices, Philadelphia 25, Pa.

Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, January 3, 1945—The Michigan Paper Company has been awarded a contract for furnishing the Government Printing Office with 163,000 pounds of white writing paper at 7.85 cents. Other paper awards made for paper bought on the open market include the following:

Bloomer Brothers Company will furnish 50,000 pounds of news board at 5.55 cents and another 30,000 pounds of the same at the same price. They will also furnish 20,000 pounds of the same at the same price Mathers Lamm Paper Company will furnish 60,000 pounds of boxboard at 3.75 cents and the Kalamazoo Paper Company will furnish 150,000 pounds of white writing paper at 7.08 cents. The same company will furnish 50,000 pounds, 80,000 pounds, 50,000 pounds, and 50,000 pounds at 7.48 and 7.28 cents. The Michigan Paper Company will furnish 115,000 pounds of white writing paper at 7.85 cents and the Stanford Paper Company will furnish 300,000 pounds of white book paper at 8.03 cents. Frank Parsons Paper Company will furnish 150,000 pounds of white V-mail paper at 6.10 cents and Whitaker Paper Company will furnish 150,000 pounds of white bond paper at 17.15 cents.

Wilcox, Walker-Furlong Paper Company will furnish 200,000 pounds of white index paper at 7.27 cents and the R. P. Andrews Paper Company will furnish 116,665 pounds of binders board at 4.14 cents. The Collins Manufacturing Company will furnish 100,000 pounds of white ledger paper at 16.49 cents and the same firm will also furnish 60,000 pounds, 50,000 pounds, and 50,000 pounds of the same at the same price. Collins Manufacturing Company will furnish 45,000 pounds of buff ledger paper at 17.22 cents and 38,000 pounds of white ledger paper at 16.49 cents.

Walker Goulard Plehn Company will furnish 35,000 pounds of white bond paper at 16 cents and the same firm will furnish 65,000 pounds of the same at the same price. Mead Sales Company will furnish 50,000 pounds of white book paper at 7.32 cents and Barton Duer & Koch will furnish 30,566 pounds of white cover paper at 12 cents. Bradner Smith & Co. will furnish 100,000 pounds of white offset paper at 8.54625 cents and the Federal Paperboard Company will furnish 100,000 pounds of chipboard at $50.50 per ton.

Michigan Paper Company will furnish 500,000 pounds of white writing paper at 7.60 cents and Barton Duer & Koch Company will furnish 15,649 pounds of white tag at 10.95 cents.

The Graham Paper Company will furnish 268,000 pounds of white book paper at 6.65 cents and the Mead Sales Company will furnish 100,000 pounds of white book paper at 7.66 cents. The same company will also furnish 80,000 of white book paper at 7.66 cents and 50,000 pounds of same at 7.86 cents.

Paper Corp of U. S. will furnish 58,100 pounds of white book paper at 8.76 cents and the Stanford Paper Company will furnish 150,000 pounds of white writing paper at 7.98 cents. Marquette Paper Company will furnish 67,857 pounds of white writing paper at 7.32 cents and Butler Company will furnish 182,143 pounds of the same at 7.8 cents. Butler Company will also furnish 39,150 pounds of white offset paper at 7.8 cents and Barton Duer & Koch will furnish 156,000 pounds of wood manila paper at 6.75 cents.

Wilcox Walter Furlong Paper Company will furnish 260,000 of white book paper at 7.81 cents and Bradner Smith & Co. will furnish 39,150 pounds of white offset paper at 7.95 cents. Central Ohio Paper Company will furnish 35,300 pounds of white paper at 6.98 cents and Stanford Paper Company will furnish 169,900 pounds of white map paper at 15.5 cents. The same company will also furnish 92,000 pounds of white map paper at 15.3 and the Stanford Paper Company will furnish 10,538 pounds of the same at 15.75 cents, and will also furnish 7,631 pounds of the same at the same price. Swigert Paper Company will furnish 200,000 pounds of white offset paper at 8.55 cents and the Mead Bales Company will furnish 20,000 pounds of white writing paper at 6.3547 cents. The same firm will also furnish 15,000 pounds of the same at 7.03 cents. Barton Duer & Koch Paper Company will furnish 50,475 pounds of tagboard at 5.88 cents, and the R. P. Andrews Paper Company will furnish 84,600 pounds of white book paper at 8.13 cents. The same firm will also furnish 76,800 pounds of white offset paper at 8.13 cents and D. L. Ward Company will furnish 86,160 pounds of white bond paper at 13.58 cents.

The D. L. Ward Company will also furnish 97,125 pounds of white bond paper at 13.58 cents and the same firm will also furnish 42,120 pounds of the same at the same price. Standard Paper Company will furnish 100,000 pounds of canary paper at 9.96 cents and Walker Goulard Plehn Company will furnish 568,000 pounds of white writing paper at 7.15 cents. The same firm will also furnish 675,000 pounds of the same at the same price.

D. L. Ward Company will furnish 131,625 pounds of white bond paper at 13.58 cents and the same firm will furnish 168,300 pounds of the same at the same price.

Heads Paper Board Division

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 27, 1944—Ralph A. Powers, of New London, Conn., has been appointed as the new director of the Paperboard Division, succeeding Arnold B. Huyssoon, of Maywood, N. J., who is returning to the Continental Paper Company, H. G. Batcheller, War Production Board Operations Vice Chairman, announced today.

Mr. Powers is president of the Robertson Paper Box Company, having been associated with that company since 1921. He was previously connected with the War Production Board in the capacity of assistant director of the Paperboard Division from November 1943 to June 1944.

Mr. Huyssoon will continue to be available as a consultant to the director, Mr. Batcheller said.

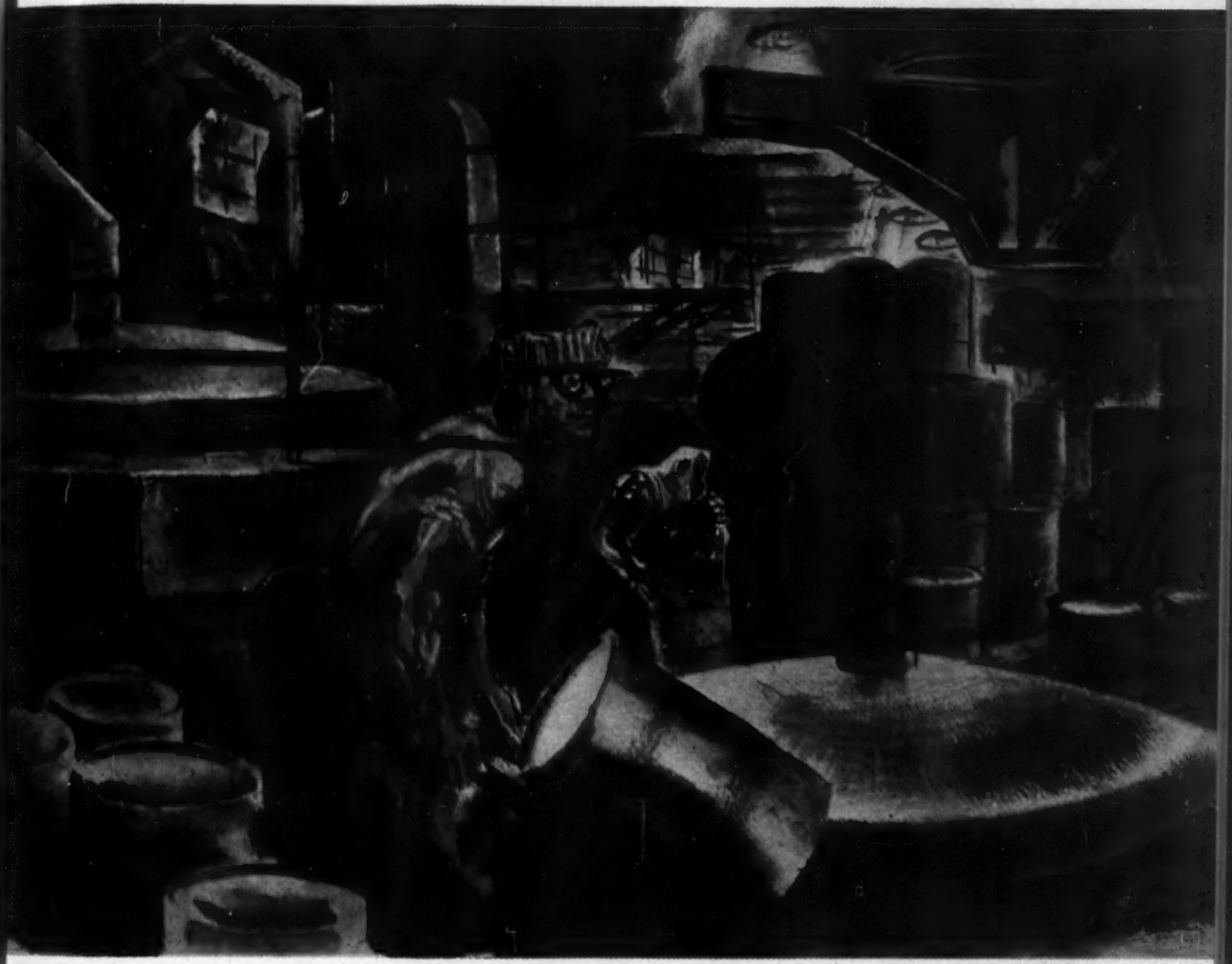
Jack Ross Starts Own Business

Jack Ross, with the J. J. Ross Company, dealers in used pulp and paper making machinery, Newark, N. J., for fifteen years, is no longer connected with that concern having terminated his connection December 26. He is now in business trading under the personal name of Jack Ross, dealer in used pulp and paper machinery, 17 Porter avenue, Newark 8, N. J.

Gordon E. Emerson Recovers

BOSTON, Mass., December 25, 1944—Gordon E. Emerson, treasurer of E. Butterworth & Co., Inc., paper stock dealers, has returned to his office after an absence of two months on account of illness.

Steady Hands . . .



View of Kettle Room at Niagara Alkali Plant

NIAGARA has greatly expanded its facilities to meet the enormous war demands for electro-chemical products. Thus as we turn to meet the growing peacetime requirements we remain "steady hands" at the job of producing materials for which Niagara has won an outstanding reputation as a quality house. This is assurance of continued good service and improved quality to those old customers who have relied upon Niagara for many years. And to new customers it means confidence in obtaining the highest standards of quality and the most experienced technical cooperation in the postwar era when electro-chemical products will be in increasing demand.

Niagara ALKALI COMPANY

60 EAST 42nd STREET, NEW YORK 17, N. Y.

CAUSTIC POTASH • CAUSTIC SODA • PARADICHLOROBENZENE • CARBONATE OF POTASH • LIQUID CHLORINE

Containers for Air Cargoes*

By J. D. Malcolmson[1]

The present speaker has two separate messages to deliver at this first National Air Cargoes Packaging Forum—a pleasant one and an unpleasant one. Let us start with the pleasant one.

Outer Containers Neglected

The airlines and their present and prospective air cargo customers have given an enormous amount of thought to such items as cargo space, cost per ton mile, speed, reduced handling, effect of high altitudes on temperature and pressure and many similar technical aspects of transporting cargo by air. It seems to us box makers, however, that not enough attention has yet been paid to the outer containers for such shipments, although it must be admitted that through the years we have become more or less accustomed to this neglect of the shipping container. It seems to be human nature when bringing out a new product or when considering a new method of transportation, to think of everything except the outer box, and time and again our industry has been called in at the last moment to do a rush job on the designing of an appropriate container. Usually we could have done a much better job had we been consulted earlier in the game, and in such an event we even could have suggested changes here and there in the design of the contents or in the method of handling shipments that would have added a lot to the all-around efficiency of the package.

In the present instance, however, we are more than pleased to see that this session today is being devoted entirely to air cargo packaging at a time considerably in advance of the big future tonnage of civilian shipments by air.

Most Essential Properties

It is quite probable that if the average shipper or airline traffic manager were to describe the ideal container for this service, he would include among its properties light weight, adequate strength to retain and protect the contents, low cost, ease of packing, sealing and handling, rigid yet cushioned walls, a certain amount of thermal insulation and nationwide accessibility. If he *should* include these properties, he would, in effect, be describing a corrugated fiber box. These containers made their astounding growth for shipment by freight, express and trucks entirely because of these very properties. Perhaps the best way to illustrate this growth is to remind you that the entire industry is only about forty years old, and its growth was only momentarily interrupted by the stock market crash of 1929 and the subsequent depression. In many industries the 1929 peaks were not regained until the present war, but in the fiber container industry, the peak of 1929 had been more than tripled with the next few years. Expressed in figures, the production of containers in the boom year of 1929 amounted to 14 billion square feet. Even in the depression year of 1933, the production had gone up to 21 billion square feet, while in 1943 this figure had risen to 48 billion square feet. If we assume that there are ten square feet in a box, this latter figure would be equivalent to 4,800 million boxes. Today, about half of all the paper made in this country is paper board and about half of all the paper board is converted into corrugated or solid fiber shipping containers.

Must Be Demonstrated to Air Lines

Today the rail and highway carriers and all shippers of goods adapted to fiber containers are fully aware of these advantages so that it only remains to demonstrate them to the more recent airline carrier and customer. Indeed, it is questionable if even this is necessary, inasmuch as all of our airlines seem to have had the luck or foresight to staff their traffic departments with a very high standard of alert and intelligent young men. In addition, practically all customers and prospective customers of the airlines are already shippers over the rails, and accordingly, are well acquaint-with the advantages of fiber containers. There is no question that one of the reasons for this rapid growth was the far-sighted effort of the industry in its early days to secure uniform specifications for shipment by rail, freight and express. As a result, Rule 41 of the Consolidated Freight Classification carries detailed specifications for the method of manufacturing, testing and loading of fiber containers for nearly one thousand different railroads and steamship lines handling domestic freight in the United States and Canada. Similarly, Rule 18 of the Official Express Classification does the same for shipments by express, and both of these Rules have been in effect for some thirty-five years, which means that they have stood the test of time.

Unfortunately, the highway trucks have never seen fit to adopt a similar uniform rule so that the container situation here is very unsatisfactory and would be worse were it not for the fact that most shippers over the highways use their regular freight or express containers.

Uniform Rule for Air Lines Imperative

This excellent rail history, together with the unsatisfactory truck situation, would seem to indicate that it is imperative for the airlines to get together immediately on a uniform container rule before waiting for the postwar rush when increased competition and other distractions will make such an agreement more and more difficult to attain as time goes on. Fortunately, the job is going to be easy on account of all these years of successful rail history, and it is only necessary to consider these existing specifications as the starting point from which to develop regulations for air cargoes. We are glad to see that this joint study of box specifications has already started and meetings are scheduled to crystalize these ideas.

The Unpleasant Side of the Situation

We now come to the more unpleasant side of the container situation. Most of this discussion to this point has been in connection with pre and post-war shipments. As most of you are aware, however, at the present moment fiber board containers constitute one of the most acute bottlenecks in our domestic and world-wide economy. In the early days of the war, fiber board was looked upon as the ultimate and inexhaustible substitute for all other packaging materials which one by one became curtailed. That fact,

* Delivered before the Aviation Section of the New York Board of Trade at the first National Air Cargo Packaging Forum, Hotel Pennsylvania, June 23, 1944.

[1] Technical Director, Robert Gair Company, Inc., New York, N. Y.

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plus the unbelievably great demands of the Army, Navy, lend-lease, and other war-time agencies for packaged goods has, however, reversed the situation so that today fiber board, and especially the so-called export V-board, is almost unobtainable except on very high priority. The very qualities of light weight, easy handling and space-saving that we mentioned as favorable for air cargo, coupled with other important qualities, are the ones that made it possible to develop V-board, especially for the smaller size or what are referred to as "one man packages".

Staggering Quantities Will Be Needed

Today, these V-boxes are found on every fighting front, and even if we are fortunate enough in the near future to require less of them for munitions, we will still have to use staggering quantities for furnishing food, clothing, medicines and other materials to the liberated areas; in other words, we can only assume today that the situation as regards availability of fiber containers is going to get worse before it gets better. Probably the only real answer to when this pressure will ease up is the speed of a successful invasion of Europe, by which is meant, a deep enough invasion to sweep beyond the scorched earth left behind by the Germans. Until the people of Europe can resume production of their own food, clothing, and other requirements, it is going to be up to the Allies to furnish these, and that means largely up to Uncle Sam, and that in turn means goods packed in V-boxes and other fiber containers. Of course, an enormous amount of high priority freight is at present travelling by air. For this, high priority fiber containers are always available, and today, when space and weight are so precious, these fiber containers are indispensable. Not the least blessing that peace will bring us will be adequate, and in fact, almost unlimited supplies of light weight corrugated and solid fiber containers for air cargoes.

To Build Plant at Greensboro

Container Corporation of America, through its Eastern Division, has announced plans for the construction of a new manufacturing plant in Greensboro, North Carolina.

Land has been acquired for the projected factory and plans for construction have been completed. Professor Walter Gropius of Harvard University, an authority on industrial architecture, was engaged as consultant in this planning. It is believed that the plant will be one of the most modern in the industry. Working quarters, ventilation, and all other facilities have been designed to provide the maximum of comfort and efficient conditions for employees.

When in operation, the plant will manufacture folding cartons and corrugated shipping containers for the industrial markets in the South.

H. D. Hyman Goes with Alex. Fleck Ltd.

OTTAWA, Ont., December 26, 1944—Howard D. Hyman, prominent in Ottawa industrial circles, has joined the firm of Alexander Fleck, Limited of Ottawa and has been appointed vice-president. In order to accept this new appointment Mr. Hyman has relinquished his position as general manager of J. R. Booth, Limited. Mr. Hyman will assume his duties with the Fleck firm in January.

Alexander Fleck Limited manufactures the Dilts Machine Works' equipment in Canada, as well as the Hydrapulper, Classifiner and other Cowles equipment.

Professor W. Oury Hisey Resigns

W. Oury Hisey, of the New York State College of Forestry, who went to South Africa in May, 1944, on a temporary engagement as consultant for the Union Corporation, Ltd., of Johannesburg, and the Industrial Development Corporation of the Union of South Africa, has resigned his position as Associate Professor of Pulp and Paper Manufacture at the College, and will remain in South Africa with these pulp and paper industries.

Professor Hisey took graduate work in pulp and paper manufacture at the New York State College of Forestry in 1924 and 1925. He studied at Columbia and Northwestern Universities, became successively research chemist for the Oxford Paper Company, research chemist for the Celotex Company and chief chemist and pulp mill superintendent of P. H. Glatfelter Company. In 1934 he came to the College as an instructor in pulp and paper manufacture under Professor Clarence E. Libby, head of the Pulp and Paper Department.

New Catalog of Technical Books

A new catalog of technical books has just been issued by The Chemical Publishing Company, Inc., 26 Court street, Brooklyn 2, N. Y. This catalog includes the latest books on chemistry, technology, physics, general science, mathematics, engineering, foods, formularies, drugs and cosmetics, gardening, medicine, metals, technical dictionaries, etc.

A copy of this catalog will be sent free to everyone who is interested in keeping up with the latest technical and scientific progress.

Lobdell-Nagle Hammer Book

The Lobdell Company of Wilmington, Del., has just issued a new Lobdell-Nagel "Hammer Book." This 24 page book is descriptive of its complete line of electrically driven air actuated forging hammers. A general description of the principle, operation and construction of the hammer, detailed specifications of each type; a list of firms who use the hammer, together with hammer installations photographed in representative plants, comprise the contents of this interesting book. The company will mail the book to parties making a request for a copy on their business letterhead.

Goes with McCann-Erickson

BOSTON, Mass., January 1, 1945 — Watson M. Gordon, for many years associated with the S. D. Warren Company as sales and advertising manager and a member of the board of directors of that company, was recently elected vice-president of McCann-Erickson, Inc. Mr. Gordon is manager of the Boston office of McCann-Erickson, New York advertising agency with offices in ten cities in the United States as well as six foreign offices in South America, three in Canada and one in London.

Paper Workers Change Address

The Paper Workers Organizing Committee, C. I. O., announces that after January 1, 1945 its national headquarters will be located at 310 Public Square Building, 33 Public Square, Cleveland 13, Ohio.

NEW PUMPS PAY

MODERN DE LAVAL PUMPS

10% to 15% more efficient than older models

De Laval single-stage, double-suction water works pump

A new pump will frequently pay for itself out of power savings within two years or less, so great have been recent improvements in pump efficiency. Let's consider a typical example:

Rate of pumping—3 mgd . . . . . Current cost—2¢ kw./hr.
Pumping head ft.—231 ft. . . . . Operation per year—5000 hrs.
Assumed motor efficiency 88%

	YOUR OLD PUMP	A NEW 1944 DE LAVAL
Pump efficiency	72%	83%
BHP	170	147
Electric HP	193	167

Power saved 19.4 kw. at 2¢ rate—38.8 cents/hr. Annual saving—5000 hrs. x .3888, or $1,940.00. A new 1944 De Laval heavy duty water works pump, with 150 hp. driving motor and reduced voltage starter, can be supplied for the sum of $2,448. Thus we have:

***Percentage return on equipment* 79⅛%**
***Time required to repay first cost* . . . . . 15 months**
***Annual saving after liquidation of investment* $1,940.00**

In many cases the cost can be reduced if the existing motors can still be used, making the return much greater. • Now is the time to plan water works improvements. A De Laval representative will be glad to help you work out the details.

De Laval Labyrinth wearing rings, sustain high efficiency

4112

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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending December 30, 1944

STOCKS

	High	Low	Last
A. P. W.	4⅛	3⅞	3⅞
Armstrong Cork Co.	44¼	42½	44⅛
Celotex Corp.	14⅜	14	14⅜
Celotex Corp., pf.	19¼	18¾	19¼
Certain-Teed Products Corp.	7¼	6½	7⅛
Certain-Teed Products Corp., pf.	129¾	122	129¾
Champion Paper & Fibre Co.	29½	28¾	29½
Champion Paper & Fibre Co., pf.	114	114	114
Congoleum Nairn Co.	29⅛	27½	29¼
Container Corp. of America	29⅛	28¾	28⅞
Continental-Diamond Fibre Co.	11⅞	10⅞	11½
Crown-Zellerbach Co.	22	21¼	21½
Crown-Zellerbach Co., pf.	103¾	103½	103½
Dixie Cup Co.	18	17¾	17¾
Dixie Cup Co., —A.	48¼	48¼	48½
Flintkote Co.	24¼	23¾	24½
Flintkote Co., pf.	...	...	...
Robert Gair	4⅛	4⅛	4⅛
Robert Gair, pf.	16⅛	15⅞	16
International Paper Co.	21¼	19⅝	21⅛
International Paper Co., pf.	93	92	92
Johns-Manville Corp.	102¼	100	102
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	38¾	37¼	38¾
Mac Andrews & Forbes	28¾	28¼	28¼
Mac Andrews & Forbes, pf.	148	147⅞	148
Masonite Corp.	42⅜	39⅞	41⅝
Mead Corp.	13	12⅝	13
Mead Corp., pf. A—6%	100	100	100
Mead Corp., pf. B—5½%	93½	93½	93½
National Container Corp.	14½	12¾	14⅛
Paraffine Companies, Inc.	57	56	57
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	17¼	16⅝	17
Rayonier, Inc., pf.	34⅛	34¼	34¼
Ruberoid Co.	33	31⅞	33
Scott Paper Co.	42½	41	42½
Scott Paper Co., pf.	109	109	109
Sutherland Paper Co.	31½	31½	31½
Union Bag & Paper Corp.	15	14⅛	14⅞
United Paperboard Co.	6¼	6¼	6¼
U. S. Gypsum Co.	80½	76⅛	79½
U. S. Gypsum Co., pf.	181	180	181
West Virginia Pulp & Paper Co.	24⅛	22¾	24⅞
West Virginia Pulp & Paper Co., pf.	109½	109½	109½

BONDS

Abitibi Pulp & Paper Co. 5s '53	112¼	108½	112¼
Celotex Corp. 3¾s '55	104¾	104¼	104¾
Certain-Teed Products Corp. 5½s '48	102	101¾	101¾
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	106¾	106⅜	106¾
International Paper Co. 5s '47	104½	104⅜	104⅜
Mead Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending December 30, 1944

STOCKS

	High	Low	Last
Great Northern Paper Co.	35½	35	35½
Hummel-Ross Fibre Corp.	7⅛	6½	7⅛
St. Regis Paper Co.	6½	5¾	6¼
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	5¼	5¼	5⅜

BONDS

American Writing Paper Co. 6s '61	101½	101½	101½

Sole Owners of Carter, Rice & Co.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 1, 1945—At a general sales meeting of Carter, Rice & Co. Corp., held at the Parker House recently, Hubert L. Carter announced that all the shares of the company's capital stock heretofore in the hands of other shareholders had been purchased, and that he and Charles A. Esty were now the sole owners of this company.

Since the death of his father, the late James Richard Carter, the majority interest has been held by his estate. By the present transaction the ownership remains in the hands of those long associated with paper merchandising and with the management of this company and the continuation of the policies which have made Carter, Rice & Co. a strong, nationally known institution is assured.

The present officers of the company are as follows: C. A. Esty, president and general manager; H. L. Carter, vice-president and treasurer; F. H. Winter, secretary; P. A. McGreenery, assistant treasurer, and J. R. Halkyard, assistant general manager.

These, with E. A. Crowell and R. H. Welsh, constitute its board of directors.

Carter, Rice & Company distributes paper, cordage, and paper products, both fine and industrial, of the country's leading manufacturers. In addition to its Boston store at 273 Summer street and the warehouse of the Charles A. Esty Paper Company Division, 185 Commercial street, Worcester, it maintains sales representation in Providence, Springfield, Hartford, Augusta, Montpelier, Syracuse, and New York City.

Offers New Abitibi Settlement

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., January 2, 1945—At a meeting of the Hughes conciliation committee dealing with the Abitibi Power and Paper Company, Ltd., with the protective committees representing the various classes of securities holders, an arrangement was proposed under which the 7% preferred shareholders would receive more than under the original plans. It was considered likely that the proposal would be accepted, as a means of satisfying all parties that it represents as nearly an equitable solution as is practicable. Under the latest proposal the 7% preferred shareholders would get five new $20 par value preferred shares instead of four $25 par value preferred shares, and since the dividend rate would remain at $2.50, these shareholders would get $12.50 instead of $10. It is suggested that the cumulative date should start on January 1, 1945, instead of two years later.

It is expected that a short supplementary addition to the main Hughes committee report will go to Premier Drew within a few days.

The bondholders are reported to be willing to accept the amendments, and if the Premier agrees, the next step will be the immediate calling of meetings of bondholders and the various classes of shareholders.

Takes Over Spaulding & Tewksbury Co.

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 1, 1945—The business of Spaulding & Tewksbury Company, Inc., Boston, Mass., the oldest box board house in New England, is to continue uninterruptedly in the hands of its successor, Lyndon B. Tewksbury, president of the old corporation which has been in liquidation during the past year.

At the same time that liquidation was voted the stockholders also voted to turn the business over to Mr. Tewksbury, with the goodwill of the old business and the right to continue doing business under the old name.

Under Mr. Tewksbury's control there will be no change in the policy and standards of the old firm, and he is retaining the goodwill and friendliness always extended to the old Spaulding & Tewksbury Company. The business continues at the old address, 222 Summer street, Boston.

Canadian Paper Stocks Rise

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., January 2, 1945—The Financial Times of Montreal, noting the steady advance in the price of the common stock of the Howard Smith Paper Mills, which has advanced to a new high for 1944 of 22¼, recalls that at the last annual meeting of the company, Harold Crabtree, president, made

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SODA ASH	CALCIUM CHLORIDE	AROMATIC INTERMEDIATES
CAUSTIC SODA	CHLORINE	DRY ICE
BICARBONATE OF SODA	HYDROGEN	More than 100 other Organic
CALCIUM CARBONATE	SODIUM ZINCATES	and Inorganic Compounds

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reference to possible dividend action, and says it is believed that this may now be forthcoming in view of the company's favorable financial condition and its good production showing. The company, it says, continues to operate at capacity, adding:

"In addition to its regular production of rag grade papers to a rated capacity of 6,000 tons annually, the company, through its subsidiary, Howard Smith Chemicals Limited, has engaged in the manufacture of vanillin, a fine chemical used as a base for flavoring extracts, which is marketed both in Canada and Great Britain.

"Another expansion of Howard Smith activity which is expected to make a worthwhile contribution to the company's revenues in the future is the plant erected at Cornwall, Ont., for the conversion of waste pulp liquor into lignin plastics. This material is said to be stronger and in other ways superior to phenolic plastics, which it resembles somewhat. Plant equipment is already delivered, and it is hoped that production, at least on an experimental scale, will be under way by next month."

Detroit Paper Products Sold

Sale of physical assets to Inland Container Corporation, Indianapolis, has been announced in a joint statement by J. Ward Hartke, president of Detroit Paper Products Corporation, and H. C. Krannert, president of Inland.

Plans call for substantial expansion, modernization and improvement of plants and equipment of the Detroit Paper plant which will henceforth be known as the Detroit Paper Products Division of Inland, Mr. Krannert said. Additional equipment will be installed to increase both capacity and the line of products made in Detroit, he added.

Mr. Hartke said that no changes in personnel are contemplated by Inland and that he would remain with the firm as divisional manager.

Champion Nets 55 Cents

The Champion Paper and Fibre Company and subsidiaries for the twelve weeks to November 12, reports consolidated net income, after $1,500,014 provision for taxes, was $461,502, equal to 55 cents a common share, against $533,887 or 75 cents a common share for 1943 period. Twenty-eight weeks to November 12: Consolidated net income $1,072,937 or $1.28 a common share compared with $1,198,221 or $1.66 a common share for corresponding period last year.

Western Tablet Earns $3.39

The Western Tablet and Stationery Corporation for the year to October 31, reports net profit, after $1,659,577 taxes and $150,000 provision for contingencies, was $624,986, equal to $3.39 a common share, against $600,787, or $3.20 a share, for previous year, when $1,236,233 was deducted for taxes.

West Virginia Nets $1.80

The West Virginia Pulp and Paper Company and subsidiaries for the year to October 31 reports net income of $2,383,587, equal to $1.80 a common share, compared with $2,610,496, or $1.86 a share in year ended Octover 31, 1943. For the 1943 fiscal year no renegotiation refund was required.

NEKOOSA-EDWARDS MORTGAGE

(Continued from page 7)

more than 700 Consolidated men are in the armed service and that 20 of them have lost their lives. The 48-hour week has been resumed, despite heavy premium payments for work in excess of the 40-hour week.

"Our plastics division is progressing as originally intended. It represents a new thought in the construction of buildings and materials. We have large government contracts for plastics material and this meets all specified tests for war use. The plastics program involves postwar accomplishment as well, and tangible plans are underway for a large volume of civilian requirements. The new plastics material for home construction is now put into use and its practical value is a certainty."

Ahdawagam Shipments Higher

Shipments by Ahdawagam Paper Products Company, Wisconsin Rapids, Wis., were about 5% greater in 1944 than for 1943, according to F. R. Walsh, manager. "This is due to the large amount of ammunition tubes and overseas boxes run during the year, and some of this will continue into next year," he said last week.

Ahdawagam's 1944 payroll will be about 10 per cent larger than in 1943. Operations during 1945 will compare favorably with last year's if the company can secure enough boxboard, Mr. Walsh believes.

"We do not anticipate any large change in our business after the year ends," Mr. Walsh said. Many of our customers are now shipping their products to the army and navy and will convert easily to civilian production."

Neenah Co. Honors Employee

The Neenah Paper Company, Neenah, Wis., last week paid tribute to William Schultz, who can boast of 40 years and 3 months of service without ever having missed a day. He started work for the company in October of 1904, and not even a sprained ankle kept him from his job.

He worked on the beater machines for 8 years, and then moved up into the sizing department, where he is still employed. During his long term of employment, Mr. Schultz has seen the firm grow from a small company.

In 1904 50 workers were employed, while today more than 300 are on the payroll.

Bertchill Paper Corp. Moves

The Bertchill Paper Corporation located at 51 East 42nd street, New York City for the past several years announces the removal of its office to 41 Park Row on January 2, 1945. This organization celebrated its 30th year in the paper business in New York City last March. It was incorporated in 1919 under the name of Berton C. Hill Company, Inc. and during 1935 the name was changed to the present title, Bertchill Paper Corporation. At a meeting of the board of directors on December 4, Louis J. Ponzini, president of the Mills Paper Company, Inc., was elected treasurer of the company.

The officers of the corporation are as follows: Berton C. Hill, president; Harry E. Lindquist, vice president; Louis J. Ponzini, treasurer; J. Gilmore Drayton, secretary.

SPECIAL ANNIVERSARY ISSUE

Because of the cancellation of the paper conventions in February, the *"American Paper Convention Daily"* will not be published. In its place will be issued a special 25th Anniversary Issue of The AMERICAN PAPER MERCHANT. In this issue will be chronicled the developments in the paper industry during the past quarter-century, including analyses of paper market fluctuations during these momentous years. In addition, there will be a symposium of articles by outstanding trade leaders, and many other interesting features. This, the February, 1945 issue of The AMERICAN PAPER MERCHANT, will be an unusually valuable advertising medium. Reserve space at once!

IT IS no mirage that has come into view through the billows of smoke from a world ablaze, but the true vision of the long-delayed recognition of the essentiality of PAPER. It has taken a world shortage to place upon PAPER the magic stamp of "the number one critical war material." This has given to PAPER the mighty wings of nationwide publicity.

Born during the hectic days just following World War I, The AMERICAN PAPER MERCHANT this year celebrates its twenty-fifth anniversary. As it prepares to celebrate this Silver Anniversary, The AMERICAN PAPER MERCHANT salutes the paper industry. It is justly proud of this great basic industry whose war record is unsurpassed, and whose future promises even greater achievements.

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PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Commodore Hotel, New York, February 19-22, 1945.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

EMPIRE STATE SECTION. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

CHICAGO PROFESSIONAL PAPER GROUP—Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

PULPWOOD

Pulpwood and wood pulp continue critical in supply as heavy over-all government requirements are likely to increase in 1945. October normally records a seasonal decline in pulpwood receipts, the Department of Commerce reports. The decline this year was 9% under September, 1944, in comparison with 3% last year. The sharpest drop recorded was in 1942, 13%, while 1941 showed a nominal 1% decline. Every region in the country registered declines in October, from 1% in the South to 27% in the Lake States. This unfavorable situation is attributed chiefly to the failure of woods workers to return from the agricultural harvest, the shortage of freight cars for ready movement of the pulpwood, and the extremely wet weather experienced in the northern sections of the country. As a result, total monthly receipts have declined below 1943 for the first time this year and receipts for the ten-month period are only 15% above the ten-month total for 1943, with domestic receipts 18% above and imports about 6% below. Total for the first ten months of 1944 were 14,178,000 cords, compared with 12,327,000 cords in 1943, and with 14,621,000 cords in 1942. This indicates an increase of 15% for the ten months of 1944, compared with the like period in 1943. Total mill receipts for November were about 1,190,000 cords, of which 1,082,000 cords were domestic wood.

In the Northeast region, the Department of Commerce reports that pulpwood stocks were less than three months' supply. Inventories were very low in October, about 2% below September 1944, and receipts 17% under October, 1943. Manpower is reported to be the chief problem in this region. Recently, however, about 1,500 war prisoners have returned to pulpwood cutting in Maine. Canadian pulpwood imports into the Northeast were about 116,300 cords, and this large amount, 39% above October, 1943, forestalled a further slowing up of pulp mill operations, the Department said. November receipts, however, sharply increased in November. Domestic receipts were 32% better than in 1943 and nearly equal to 1942. Market wood was up 44% and company-produced wood rose 28% above a year ago, the War Activities Committee of the Pulpwood Committee of the Pulpwood Consuming Industries, reported last week.

Pulpwood receipts in the Appalachian region for the first ten months of 1944 were 1,270,000 cords, compared with 1,024,000 cords in 1943, and with 1,258,000 cords in 1942. The ten-month increase in 1944 over 1943 was 24%; total consumption for the ten months was 1,229,000 cords, or 2.2% higher than in 1943. Inventories for the ten months totaled 328,000 cords, an increase for the period of 36.6%. November receipts in this region were 9% below 1943.

Severe weather conditions in the South, and the withdrawal of war prisoners for agricultural harvests, resulted in a 2% decline in October receipts of pulpwood below September, 1944. Inventories were about 75% above October, 1943, despite a decline of 22% from September. Some mills suffered heavier inventory declines than others and the production of kraft paper and board was reduced in such mills. Total receipts for the ten months of 1944 in the South were 5,714,000 cords, compared with 5,009,000 cords in 1943, and with 5,394,000 cords in 1942. The increase for the ten month period of 1944 was 14.1% higher than in 1943. Receipts of pulpwood in the South in November were 5% below 1943. Consumption for the ten months of 1944 totaled 5,701,000 cords, compared with 4,969,000 cords in 1943, and with 5,535,000 cords in 1942, an increase of 14.7%. Inventories for the ten months were 293,000 cords, an increase of 74.7% in 1944 above 1943.

Pulpwood receipts in the Lake States for the ten months of 1944 totaled 2,296,000 cords, compared with 1,578,000 cords in 1943, and with 2,038,000 cords in 1942. This is an increase of 45.5% in 1944 above 1943. Consumption totaled 2,010,000 cords for the ten months, an increase of 5.7% in 1944 above 1943. Inventories totaled 1,213,000 cords in the ten months, an increase of 21.4% in 1944 above the ten-month period in 1943. November receipts were only slightly above November, 1943.

With good logging weather during October, receipts of pulpwood in the Pacific Northwest declined 14% under September, 1943. Total receipts for the ten months of 1944 were 2,303,000 cords, compared with 2,122,000 cords in 1943, and with 2,538,000 cords in 1942. The increase in 1944 above 1943 was 8.5%. Consumption in the Pacific Northwest for the ten months of 1944 totaled 2,053,000 cords, an increase of 8.4% above 1943. Inventories for the ten months totaled 559,000 cords an increase of 17.1% in 1944 above 1943. November receipts were 14% under 1943.

In commenting on the pulp supply situation the Department of Commerce states in part: "With the close of the harvest season, the prisoners of war utilized have returned to pulpwood cutting. Close to 10,000 war prisoners are being used and there has been very little demand for any new camps. Camps in existence are being filled to capacity. No increase or decrease in the number of war prisoners working is expected. . . . In November, the WPB and Canadian officials concurred on a program for exports from Canada of pulpwood, wood pulp, and newsprint for the first six months of 1945. Subject to upward adjustment in accordance with the agreement that has operated for more than a year for an equal sharing between the two countries of total Canadian production of 'purchased' pulpwood, exports during 1945 have been set at a minimum of 1,250,000 cords. The 1944 import quota was originally set at this same figure, but was increased in July of this year by a supplementary allocation of approximately 250,000 cords. The exact amount of the additional 1945 quota will not be determined until after the close of the pulpwood production season in Canada next spring. United States mills are scheduled to receive about 200,000 cords from Canada before the end of this year to meet the 1944 quota. Of this balance, the Northeastern mills are to receive 125,000 cords, and the Lake States mills about 75,000 cords."

Buckeye to Build Pulp Plant

MEMPHIS, Tenn., January 2, 1945—W. F. Bowld, manager of the chemical pulp division of Buckeye Cotton Oil Company in Memphis, said today he has been requested by the War Production Board to build and operate a new pulp plant in Memphis to cost between $2,000,000 and $3,000,000. The plant, he said, will produce cotton linters pulp for the manufacture of smokeless powder to meet ever increasing war needs. "I am working on plans now," Mr. Bowld said.

He said the new plant will be financed by Defense Plants Corporation and probably will be near the Jackson avenue pulp plant of Buckeye, for several years engaged in war production. "By being near our present plant we can make use of key personnel in the new work," he said.

The new plant will be operated by Buckeye, producing the same type of pulp the regular plant is making, Mr. Bowld said. He will continue operating the old plant along with the new. He said WPB has requested speed in getting the new plant under construction.

Permutit Elects New Officers

The Permutit Company of New York, manufacturer of water conditioning equipment, announces the election of W. Spencer Robertson as chairman of its board of directors and Henry W. Foulds as president. Mr. Robertson has been president of the company for the past 15 years while Mr. Foulds has been Executive Vice-President since 1935. Prior to that time, he had been a Vice-President and Director of Goulds Pumps, Inc. and a Vice-President of Servel, Inc.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1944		Corresponding Weeks—1943	
Nov. 18	91.7	Nov. 20	91.4
Nov. 25	88.2	Nov. 27	87.6
Dec. 2	92.2	Dec. 4	92.2
Dec. 9	93.6	Dec. 11	88.9
Dec. 16	89.2	Dec. 18	89.9
Dec. 23	*83.8*	Dec. 25	68.6

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1943	87.2	88.9	89.5	88.7	91.4	84.8	84.3	91.0	88.3	89.6	89.6	82.0	87.8
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	*91.9*		

COMPARATIVE YEARLY SUMMARIES

	1937	1938	1939	1940	1941	1942	1943	1944
Year to Date	80.5	71.7	83.5	86.1	97.3	90.7	88.1	*83.7*
Year Average	79.8	71.5	83.4	85.6	97.4	90.4	87.8	

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1938	56	63	63	60	60	59	59	69	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	83	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	89	96	94	94	93	87	93
1944	90	96	95	96	96	96	85	96	92	95	*95*		

Week ending Nov. 18, 1944—96 Week ending Dec. 9, 1944—95
Week ending Nov. 25, 1944—91 Week ending Dec. 16, 1944—94
Week ending Dec. 2, 1944—94 Week ending Dec. 23, 1944—*94*

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Pennsalt Field Men Meet

A meeting of the field men of the Special Chemicals Division was held recently at the home office of the Pennsylvania Salt Manufacturing Company in Philadelphia. Wm. P. Drake, manager of sales, called the meeting to review the division's present activities and to discuss plans for expansion. The conference covered a period of four days.

Originally formed to market and service alkaline-type industrial cleaners, the Division's activities have expanded to include acid and solvent emulsion type cleaners; acid and alkali proof cements, paints, and other corrosion-proof coatings and products; pickling and descaling products, including acid inhibitors and various inhibited and specialized acids; and electroplating solutions.

One of the highlights of the meeting was a visit to the Company's new Whitemarsh Research Laboratories to view the Research, Development, and Sales Service Laboratories devoted to developing products and solving problems with the Company's products in the fields covered by the Special Chemicals Division. During the visit to Whitemarsh, a number of new specialty chemicals, which will soon be ready for marketing, were demonstrated to the field men.

In attendance at the meeting was the entire field force, located in strategic cities from coast to coast, augmented by representatives from The Chemical Corporation and Sessions-Gifford Company, Inc., who handle the Special Chemicals Division products exclusively in the New England area.

A. M. Eaton-F. E. Vincent Co. Formed

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., January 1, 1945—A new company, under the name of the A. M. Eaton-F. E. Vincent Company, wrapping paper merchants, was incorporated as of December 18 under the laws of Massachusetts, with a capitalization of $20,000. Incorporators F. H. Blackman, J. J. Blackman, and J. J. Handrahan.

Tending a paper machine is much like tending a baby—most of the troubles begin at the wet end. This explains why experienced paper manufacturers equip the wet ends of their machines with Hamilton Felts. There is mighty little wetness left in a sheet when it leaves a Hamilton Felt and begins its journey to the winder and slitters. In fact, it is so dry and so well formed that the finishing process requires little time and less steam. Broke is insignificant.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Some Applications of Deionizing Equipment

By W. S. Morrison[1]

Abstract

After a general summary of the equipment required for the deionization of water, case studies of commercial installations are presented to illustrate the possibilities of water treatment systems by the pulp and paper industry.

It is the purpose of this paper to present the type of industrial equipment necessary in the use of exchange resins and also to review some of the deionizing units in actual field service.

The resins are normally housed in vertical cylindrical pressure tanks. To insure the water being treated passing uniformly through the bed so that all parts of the resin are utilized equally, water is introduced at the top of the tank and collected at the bottom by a system of piping called distributors. To prevent the loss of resin through the lower distributor and to aid in the equal flow of the water through the bed, the resins are supported by several layers of pure quartz gravel ranging from coarse at the bottom to fine at the top.

In addition to the tank, provision is made for water connections at top and bottom and for controlling the flow of water as well as an injection system for regenerant solution. This may be done with a series of individual valves, by the same valves remote controlled from a central location, or more usually, by a single multiport valve which in itself controls the phases of regeneration. Naturally, the tanks themselves, the distributors, piping, and valves must all be resistant to the corrosive action of the dilute acids encountered, not only to prevent destruction of the equipment but to protect the purity of the treated water. Freedom from corrosion is obtained by fabricating of materials inherently resistant to the acids or by lining steel with acid proof materials such as plastic or rubber.

In addition to the actual reactor tanks there must be suitable tanks for holding the proper regenerant solutions and methods of introducing them into the resin beds in the proper concentrations. The latter may be done by pumping or by the use of a hydraulic ejector. Minimum mechanical requirements for the production of pure deionized water also include meters for measuring the quantity of water treated as well as its purity. In some cases means must be provided for dispelling CO_2 and hence raising the pH. Where large volumes of water are required intermittently, a storage tank and pump eliminates the need of much larger equipment.

Storage tanks are essential in those installations requiring 24 hour a day production, to carry over the regeneration period, or the entire equipment built in duplicate so that one set of tanks is operated while the other is down for regeneration.

Where the raw water contains appreciable magnesium, a sodium zeolite water softener is provided to supply magnesium free water for making up soda ash solutions as well as providing softened water for the actual regeneration of the acid adsorbing resin. This is done to eliminate the precipitation of $Mg(OH)_2$ on the bed, lengthening the rinse period of regeneration. Water from the cationic exchanger could be used but the use of the softener permits the exchanger to be regenerated at the same time and also eliminates the use of some of the capacity of the cationic exchanger.

The capacity of the equipment is a function of the amount of resin in the tanks with an inherent capacity for each cubic foot, and the concentration of solids in the water being treated. Thus, a given amount of resin may have a capacity on a certain water to treat 10,000 gallons before it is regenerated and on a water containing 1/10 the solids it will treat 100,000 gallons between regenerations. The length of time between regenerations will depend, of course, upon the rate the 10,000 or 100,000 gallons are used.

A typical unit set up for service consists of a plastic lined steel tank 54 inches in diameter by 84 inches for using 64 cubic feet of Amberlite IR-100. The anionic unit is 30 inches in diameter by 72 inches and contains 12 cubic feet of IR-4. The cationic removal unit is guaranteed to produce 65,000 gallons of treated water between regenerations. The plant operates at a rate of 1,000 gallons per hour and is guaranteed to produce water having a total salt content of 10 or less p.p.m. This is to include 2.05 p.p.m. of silica which is not removed by the exchange process. The water can be used for a number of different purposes and they include the purification and washing of chemical products, the preparation of patent medicines, drugs, antiseptics, and the washing of ampoules. With an excess of pure water available, a number of new purposes were found for the high quality water which they are producing at 12 cents per 1,000 gallons.

Another installation was installed just a year ago in

[1] Illinois Water Treatment Co., Rockford, Ill.

a defense plant in Florida. This plant is producing 60,000 gallons of water between regenerations at a flow rate of 3,000 gallons per hour. This plant is operating a large anodizing department for the oxidation of aircraft aluminum parts. They had followed the chromic acid method of oxidizing aluminum and found that in the hot rinse step following oxidation, 15 grain water precipitated noticeable traces of calcium salts on the anodized piece. A deionizing unit was piped to the bath as well as to the chromic acid tank so that make-up due to drag out was maintained with salt free water. Whereas it was necessary to employ considerable help in the polishing of aluminum parts coated with calcium deposits, once the deionized water was used this costly step could be avoided completely. Completely salt free water, it was observed, was the only approach to the solution of this aircraft problem. Raising the sodium content of the supply or exchanging calcium for sodium as in other zeolitic processes would have had aggressive chemical effect on the aluminum surface.

The following example exemplifies the lower range of soluble solid content on which the resins have been found to be commercially effective. In one of the nation's foremost distilleries a battery of steam still units was producing more than 4,000,000 gallons of distilled water annually for the reduction of high proof spirits. Were it not for the extreme danger of contaminating their product it would have been ideal to use steam condensate for reduction purposes. Examination studies of the condensate convinced the distilleries, however, that carry-over from the boiler plant plus soluble iron, picked up in return lines produced a variance in solids from 10 to as high as 60 p.p.m. It was suggested that this condensate water be used as a raw supply to exchanger equipment as any undue changes in the supply would not affect the exchange qualities of the resins. This was done and the effluent was kept at temperatures below 93°F. The solid content of the final water averaged 1.5 p.p.m.

A plant in the southwest required large quantities of water for quenching aluminum after heat treatment. The supply contained high concentration of sodium chloride and sodium carbonate. The presence of these salts, it was determined, was responsible for etching and corroding the finished material; so it was decided to install a deionizing plant to remove them, the plant producing 500 gallons per minute, 24 hours a day. Because of the high solids in the supply, however, the cation exchange tanks are 10 feet in diameter and all six are 10 feet high on the side sheet. The water supply varies from 600 to 1700 p.p.m. total solids, of which about 70% are present as the chloride salt. The treated water was found to contain about 30 p.p.m. of which chloride salts amounted to 2 p.p.m.

An Indianapolis manufacturer plating silver on various engine bearings found it necessary to deionize the water used in the makeup of silver plating baths and for washing silver bearings. An analysis of the water showed the following before treatment and after treatment. as shown in Table I.

The treated water was found to have a resistance of 310,000 ohms per ml. which was very satisfactory for additions to the plating solutions. The presence of calcium and magnesium salts had evidently affected the adherence of silver to the base metal and this condition was eliminated with pure water makeup. In rinsing the bearings water spots that had been noticed on the dried pieces when raw water was used were eliminated. Costly buffing and cleaning operations

TABLE I.

	Before Treatment p.p.m.	After Treatment p.p.m.
Total solids	399	less than 10
Loss on ignition	103	
Calcium	62	absent *
Magnesium	28	absent *
Iron	0.05	absent *
pH	8.4	5.1
Chloride	15	0
Sulphate	100	0

* As determined by conductometric method.

were thereby eliminated. A portion of the water from the water treatment plant was deaerated and used as makeup for boiler feed work. Needless to say, the plant has had no difficulties with scale formations or with foaming and priming since the installation was put into service.

The ion exchange resins have made possible the preparation of solid free water equivalent to distilled water in so far as mineral content is concerned by using simple filtration processes. It should be pointed out that these materials have been accepted in a number of industries other than in preparing pure water. The acid adsorption resins are already being used commercially in the industrial process of deacidification of formaldehyde and cation resins have been proven on full commercial scale in the removal of cations in polyhydric alcohol and in the purification of sugar juices. The latter development may revolutionize the entire industrial sugar refinery process. The exchangers were also called upon to extract tartrates from wine and wine slops and this was successfully carried out in a large winery in California. There are a number of special problems which the research chemist can undertake with these remarkable new chemical tools. In some of the special cases, it should not be implied that the problems are completely solved. Each special application of the resins is exploratory and the sketchy results presented are merely indicative of what may be investigated. The variety of resinous materials offers many interesting avenues of approach to the solution of the problems confronting the industrial chemist.

Food Technology

Interscience Publishers have just issued Volume II of Chemistry and Technology of Food and Food Products (890 pp. 7 x 10) edited by Morris B. Jacobs, Senior Chemist, Department of Health, New York City, and prepared by a group of 27 specialists. Forty-one collaborators participated in the preparation of the two volumes. The first volume deals with fundamentals common to all foods, the second concerns the descriptive aspect of particular food groups and includes some account of the history, statistics, definitions, standards composition, chemistry and packaging of these foods.

Among the subjects covered in Volume II are Unit Operations and Proceses, including dehydrating, Food Supervision by Government Agencies, Food grading, Food machines, Preservation and Production. There is an excellent chapter by C. W. Browne, Editor of Modern Packaging on Packaging, dealing with the function of packaging, package design, materials of packaging, kinds of packages, packaging operations and packing and shipping. It is this subject in particular that is of interest to the paper industry.

Copies of Volumes I and II may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York 17, N. Y., at $19.00 per set. Individual volumes are $10.50.

Low-Pressure Laminating

By J. D. Nelson[1]

Abstract

The low-pressure laminating technique is being used in the fabrication of irregularly shaped products where the high-pressure method can not be readily adapted. Although the products made using low pressures do not have the characteristics of those made using high pressures, by correct combination of resin, filler, process modification, etc., a product can be produced which is satisfactory for many purposes.

There is a fairly wide choice of techniques which can be used but the hydraulic membrane or rubber bag process is the most popular. In this, the molds can be made of such low strength materials as sheet metal, wood, concrete, plaster of Paris, etc.

The strength properties of the low-pressure laminates compare favorably with the high-pressure laminates for most uses and have additional advantages which are favorable to its continued development.

Much attention has been focused recently on the low-pressure laminating process and the wide application it is now finding in the war effort. It has generally been pictured as a brand new cure-all which would eventually replace the conventional high-pressure techniques. Actually, the process itself is old, but outstanding developments in materials and methods, coupled with the urgency of the situation, have greatly expanded its general utility and revealed its tremendous possibilities. While low-pressure methods will undoubtedly find extended usage after the war, they will continue to supplement, in many instances, the general functions of high-pressure laminating.

The purpose of this paper will be to present an overall picture of the process, materials, its advantages, future potentialities and shortcomings, with emphasis being placed on the part that paper base laminates are playing.

Although the low-pressure bonding of wood veneer has been an accomplished fact for some time, it has only been in the last few years that fabric and paper base laminates have found their way into the field. Faced with a scarcity of basic raw materials and the necessity of finding replacements for existing metal parts several industries, particularly the aircraft, turned to plastics for a solution. Synthetic resin bonded veneer filled the bill and is continuing to be entirely adequate in many applications. However, it was found that the parts were generally of such a nature that either fabric or paper had to be used, because of their vastly superior formability, handling qualities, and strength properties. As the development of resins and fillers progressed, it soon became apparent that the low-pressure laminated articles possessed sufficient advantages to be sold on their merit alone, rather than as replacements.

Low-Pressure Laminates

The first low-pressure laminated objects, and still by far the largest volume, were those requiring very little structurally, outside of stiffness and moisture resistance. Disregarding sheet stock, applications which naturally suggest a low-pressure technique are those which are not easily laminated by the conventional high-pressure methods, but still require to a large degree the toughness obtained from the continuity of fiber found in laminated products. Usually of irregular contour, such aircraft parts as fairings, fillets, housings, cowlings, ducts, and the like are excellent examples of objects which would be extremely difficult if not impossible to laminate at high pressures; yet because the loads they are required to carry are not particularly severe, their production by low pressure is entirely feasible. Recently, fiberglass and high-strength paper laminates have extended the applications to include semistructural and structural items.

Differences between High- and Low-Pressure Laminating

A clear picture of the differences between high- and low-pressure laminating is essential for an understanding of the potentialities of the latter. While high-pressure laminating of sheets, rods, tubes, and molded laminated articles usually involves the pressing of impregnated and dried sheet stock material at pressures ranging from 1000 to 2000 p.s.i., the low-pressure range is less than 300 p.s.i., the bulk of it actually being done below 100 p.s.i. A further important differentiation is in the type of pressure itself. Unidirectional or platen pressure is employed in high-pressure techniques. In the majority of low-pressure processes, on the other hand, omnidirectional or hydraulic pressure is utilized. The advantages of this type pressure in producing uniform material is quite obvious. Curing temperatures in high pressure laminating run from 150 to 165° C. for phenolics to 130 to 150° C. for ureas. The corresponding temperatures in low-pressure laminating may be the same, but sometimes are lower. This is especially desirable where a rubber diaphragm or bag is used repeatedly as the hydraulic membrane.

The fabric or paper base stocks for high pressure work has been dried to a relatively low volatile content, the high pressure being required for compression and bonding of the individual laminates. Since the low-pressure sheet stock is bonded at lower pressures and in addition must be formed to shape both before and during the laminating operation, much higher volatiles are in order.

The use of higher volatile and lower pressure in the curing operation has demanded new types of resin to meet these requirements. In the thermosetting class the highly condensed liquid type has been found to be most satisfactory. The later conversion to the cured state will thus liberate minimum amounts of reaction products. This is especially important in low-pressure methods since most of these reaction products must be removed mechanically during cure. In addition to high condensation, stability at low temperatures and potential convertability at intermediate and higher temperatures is desirable. Of the thermosets, the phenolic types are perhaps finding widest usage, with the ureas and melamine-ureas next in line.

Resin and Filler Combinations

The correct combination of resin and filler depends

[1] Plastics Department, General Electric Co.

largely on the individual part and choice of low-pressure operation. In a majority of cases, the stock should be flexible, since it probably will be formed over complex curvatures. A loosely woven cloth naturally suggests itself as a suitable filler material. However, too loose a weave will considerably lower the strength values and materially affect the bond. Paper base materials bond much better at low pressures than cloth base laminates, but of course their formability is inferior. For secondary parts, where assembly times and not strengths are of prime importance, the use of creped paper has been put to good advantage. For parts requiring the highest tensile and flexural strengths, paper base laminates, particularly the high strength Mitscherlich sulphites are being efficiently used through the medium of proper templates prepared in advance. Such paper base laminates are far superior to cloth base mechanically and are approaching the latter in toughness.

The determination of the most advantageous resin content for each application will largely depend on the end use of the product itself. Since at best, the bonding at low pressures is only fair, enough resin must be present to make this the best possible. While moisture absorptions at low pressures are apt to be high, higher resin contents and more uniform impregnations will both help this property. However, too much resin will embrittle the part and destroy the toughness which most of these applications are called upon to exhibit. Cloth base laminates usually require more resin than paper base laminates for comparable end use.

After selection of suitable filler and optimum resin content, the correct treated condition for the laminated sheet stocks must be decided upon. The material should be wet enough to allow the natural formability of the sheet stock to take place and yet not too wet to be made under treating machine conditions. In addition, a very wet material has a poorer cure, excessive squeeze out of resin, and resultant poorer bonding than a more correctly treated material. Too dry a material, on the other hand, will make bonding very difficult, in addition to impairing the filler formability mentioned previously. Paper base stocks in general are able to tolerate lower volatile and greater variation in volatile than corresponding cloth base stocks.

It is quite apparent that one basic sheet stock possessing all of the desired characteristics would be quite impossible to establish. It is likewise obvious, that economically, a special sheet stock for each application is not feasible, especially where a wide variety of parts are being fabricated. The correct balance and use of a small number of standard materials that will do a variety of jobs well are proving most satisfactory to fabricators. Parts with very complex curvatures will require flexible cloth stock or a templated paper base. Parts with regular curvature can advantageously be manufactured with paper base stock. The degree of moisture resistance desired will determine largely the type and amount of resin to use, while all considerations are subject to the strengths required in the finished article.

Although the phenolic and urea thermosetting laminates are being processed for the most part with treated stocks such as those described above, a large number of applications are being successfully performed through the use of thermoplastic and thermosetting ester type resins in which the so-called wet laminating process is resorted to. In these methods polymeric solutions are applied to the filler, laminate construction built up, and bonding effected through solvent evaporation. In the case of monomeric solution, after application and build up, polymerization is brought about by heat and pressure. Although the operations are messy and are not conducive to high production, the use of much lower pressures, which are in the range of contact to 15 p.s.i., and unusual toughness and electrical characteristics in the finished parts make the process adaptable in many cases.

Laminating Process

Up to now the materials used in low-pressure laminating and how they differ from the high-pressure stocks have been considered. The materials are naturally of prime importance, but the relative success or failure of the part will probably depend in the end on the low-pressure laminating process itself. It is here that the ingenuity and foresight of the fabricator is felt in the largest degree. There is as yet no really standard equipment for low-pressure work. Each job requires individual considerations. The number of parts to be made, likelihood of part redesign, availability of equipment and facilities, and above all, the time factor, are some of the many problems which must be faced before a part can even be considered. That fabricators are meeting these problems is proven almost daily by the advances in laminating techniques and production of parts formerly believed impossible to make. Even personnel who have never had laminating experience, after becoming cognizant of the possibilities of the process, are having outstanding success in the new field.

Since the pressure and probably the heat used in low-pressure laminating are relatively low, the mold construction or pressing equipment may be much weaker and more simplified in nature, hence lower in cost and easier to produce. As a result of these facts, most of the low-pressure methods of today may be classified into two types: those in which conventional molds and pressing equipment are used but of course, at much reduced pressures, and those in which one-half of the mold is rigid and the other half consists of a flexible membrane or sheet by means of which hydraulic pressure or its equivalent, is transmitted to the article being laminated.

The use of low pressures, especially in paper base sheet stock, has allowed considerable equipment, which otherwise could not have been used, to successfully produce low-pressure materials. In addition the size of the sheets have been materially increased through the reduction in required pressure. By utilizing such mold materials as Kirksite, cast bronze, cast iron, and certain low melting alloys, mechanically adequate, low cost, and easily constructed molds have been made which could be used in conventional hydraulic presses at reduced pressures. The ability to be remelted and recast into new molds is another advantage of many of these materials.

When the hydraulic membrane or rubber bag process is used, the rigid half of the mold, whether male or female, may be constructed of the above mentioned cast materials, sheet metal, or such low cost and readily available materials as wood, concrete, plaster of Paris, papier-mache, and combinations of these. The hydraulic membrane or bag—usually rubber or rubberized fabric—is placed between the built up laminae and hydraulic medium to insure even application of pressure and suitable

finish. The hydraulic pressure medium used may be steam, water, oil, air, etc., while the heat for laminating may come from either side of the molding surface, from the hydraulic medium or from a separate source. For large production quantities, autoclaves or pressure cookers are finding wide usage. For moderate production, inexpensive individual setups are frequently most economical. The common hot press is particularly adaptable for many low pressure objects. A series of simple cast molds may be used interchangeably with the expanding rubber bag, the only serious limitation being that of size. Another common arrangement is the combination of a female mold in a conventional hydraulic press with a rubber male member.

Mold Materials

Probably the widest used mold material at the present time is sheet metal. These molds are easy to make (they may even be the original parts themselves), are lightweight, impart good finishes, allow excellent heat conductivity and when used with the hydraulic pressure being exerted on both sides, are more than adequate mechanically. They are particularly useful where a large autoclave may be more efficiently filled and several objects produced in one curing cycle.

Wood makes an excellent, lightweight material for mold construction, but its service life is naturally limited and heat conductivity only fair. Improved construction is made possible by laminating plies of wood, treating the surfaces with hardening agents such as thermosetting resins, or lining the molds with cement or metal facings.

Concrete and plaster of Paris are both materials which are easily cast to shape, in addition to being capable of imparting a polished surface to the laminated article. Heating coils may be cast in the mold themselves or the mold thickness may be made as thin as possible to allow the quickest transfer of heat when placed in a curing ambient. Here too, however, relatively low serviceability is an important factor to be considered.

Papier-mache molds are finding limited use where the laminated parts require little or no pressure. Wood pulp and a water soluble binder are intimately mixed before forming to shape and drying. After the laminating cycle, the mold is destroyed by dissolving out the binder and removing the pulp. Although it can be used only once, the low cost and ease of construction make papier-mache attractive in many instances.

The above mentioned mold materials and low-pressures methods are but a few examples of the existing processes as they now are known. In this ever changing field, new developments are occurring daily and what is news today, may be discarded tomorrow.

Properties

Having briefly discussed the materials and methods of low-pressure laminating, attention is devoted to the properties obtained, particularly as they relate to comparable high-pressure stock. As one would naturally expect, lower laminating pressures mean less compression, poorer bonding, and lower gravities. In the case of paper base laminates, however, the bonding is but slightly inferior. As a direct result of these properties, the moisture absorption of those parts which are not specially treated to resist moisture is higher. On the other hand, lower pressures in combination with lower curing temperatures mean less distortion or rupturing of the laminate fibers, hence a more efficient utilization of the fibers themselves.

As far as actual strength values themselves go, that is tensile, flexural, compressive, and modulus of elasticity, the low-pressure laminates of a typical cotton cloth, laminated with phenolic resin at 65 p.s.i. pressure, exhibit generally slightly lower values than those of a comparable grade "C" high-pressure laminate, although the differences are minute compared to difference in pressure. Paper base stocks laminated with the same resin at 65 p.s.i. all show considerable strength advantages over both the high- and low-pressure cloth laminates and are at least on a par with grade "X" high-pressure paper laminates. Among the paper base laminates themselves, ordinary saturating kraft gave the lowest values, certain rag papers were considerably stronger, and the Mitscherlich sulphite types were outstanding. In tension, the paper base stocks averaged 13,000 to 27,000 p.s.i. as against 8 to 10,000 p.s.i. for cloth base. In flexure, the values for paper were 25,000 to 30,000 p.s.i. as compared to 18,000 to 20,000 p.s.i. for cloth base. Compressive strengths for both cloth and paper stocks ran 40,000 to 45,000 p.s.i., while modulus of elasticity of the paper stocks were higher, 800,000 to 2,000,000 p.s.i. as against 500,000 to 800,000 p.s.i. Paper base stocks were slightly higher in gravity but lower in moisture absorption. In passing it might be mentioned that low-pressure laminated glass cloth and glass cotton combinations give really superior strengths, but general utility is limited because of high gravity and relative unavailability.

The foregoing values present an average picture of the strength of the bulk of the low-pressure laminates being produced at present, largely because most of the autoclave heating and pressure mediums are running at 65 to 75 p.s.i. It is interesting to compare these values with those obtained in the range up to 300 p.s.i. and even in the higher potentially available range up to the beginning of the high pressure range at 1000 p.s.i. Extensive tests along these lines with cloth and paper base laminates have indicated the following general trends to hold:

In tensile, the strengths increase gradually up to about 300 p.s.i. pressure and then tend to level off or drop slightly. The phenolic resin gives superior strengths to the urea type. In flexure, there is a sharp initial increase in strength up to 100 p.s.i.

TABLE I.—COMPARISON OF PHENOLIC LOW-PRESSURE LAMINATED FILLERS WITH COMPARABLE HIGH-PRESSURE STOCK

Filler	Lamination Pressures p.s.i.	Tensile Strength	Tensile Modulus	Flexural Strength	Compressive Strength	Resin Con.	Sp. Gr.	24 Hr. H_2O Abs.
Grade "C" cloth	1000–1500	10,000	500,000–1,000,000	20,000	40,000	45–50	1.36	1.5
Cotton cloth	65	8,250	327,000	18,250	27,400	54	1.30	3.35
Grade "X" paper	1000–1500	16,000	.....	27,000	40,000	..	1.38	2.75
Saturating kraft	65	12,600	810,000	24,500	34,500	54	1.35	1.3
Rag paper	65	19,400	900,000	26,550	46,600	52	1.38	1.25
Mitscherlich sulphite paper	65	27,100	1,880,000	30,800	39,000	38	1.36	3.1
Glass-cotton cloth	75	30,000	2,400,000	41,400	60,000	30	1.54	1.48

pressure and then a leveling off or more gradual increase up to about 700 p.s.i. It is revealing to note that about 2/3 of the potential flexural strength of the phenolic is realized at 100 p.s.i. while only ¼ to ⅓ is realized with the urea. In compression, the strengths of both resin type laminates are comparable with the greatest increase occurring up to the 100 p.s.i. level. The corresponding moisture absorption values over the same pressure range indicate a sharp decrease in absorption up to 100 p.s.i. pressure and then a leveling off. The phenolic not only exhibits very low absorption but reaches its minimum value around 100 p.s.i., particularly in cloth base types.

From these results, it may be concluded that the use of 50 to 55% resin for cloth base and saturating paper base laminates and 35 to 40% resin for high strength paper base laminates in a pressure range of 100 to 300 p.s.i. would give about the maximum in mechanical and physical properties without resorting to the high pressure range. Actually a rough increase in strength of 25 to 30% may be expected by increasing the laminating pressure from its present level of 65 to 75 p.s.i. to 300 p.s.i., with only a slight additional advantage resulting at higher pressures. Thus, at the present limits, the effective utilization of potential strength is quite high for the phenolic resin types. In flat sheet stock material using high-strength paper and in certain other low-pressure molding operations, the pressure range of around 300 p.s.i. is already practical and giving excellent results.

Applicability

Generally speaking, therefore, low-pressure laminating produces a type of product which compares favorably in most respects with high-pressure laminating. It is an obvious outlet for intricately shaped parts where weight savings and high strengths are essential. With the advent of flat sheet stock produced from high-strength paper, table tops, radio panels, switchboard panels, instrument panels, and other applications which formerly were limited in use because of their inferior strength-weight ratios are now being successfully fabricated. Low-pressure laminating is solving many a problem now because of necessity, but it certainly possesses enough desirable characteristics to insure its rightful place in laminating for some time to come.

It is equally obvious that the role that paper base laminates are playing and will continue to play in low-pressure operations is large indeed. Possessing inherently good mechanical properties, coupled with the rapid strides being made in improving these properties, paper as low-pressure material has the following additional advantages:

1. Partial elimination of variations in laminating stocks.
2. High yield of basic raw materials.
3. Excellent bonding strength, even at very low pressures.
4. High relative availability in normal times.
5. Ability to impart very low moisture absorption to finished laminates.
6. Ease of handling.
7. Reduced cost.

Miscellaneous Applications

Some other miscellaneous applications of paper in low-pressure operations which come to mind are its use as a stiffening skin in high-strength-low density sandwich material and general utility in tube applications. Of particular interest in this respect is a special cold wound shell made from paper and liquid type cold or semi-cold setting resin adhesives. This is not merely another glue-bonded tube, but a laminated plastic in the truest sense of the word, since the paper laminates are both impregnated and bonded together in one operation. While the contours of these shells are necessarily uniform throughout their length, the variety of crossectional shapes and fabrication possibilities make their application much larger. With simple, inexpensive, split wooden mandrels, the winding operation takes only 3 to 4 minutes, the shells being removed after further cure at room or slightly elevated temperatures. The shells themselves are easily finished or machined in addition to possessing desirable strength characteristics and moisture resistance.

Decorative Sheet for Plywood

A further use of paper base stock that is finding increasingly more application is as a protective and decorative sheet for plywood. Whether applied as a face sheet in the regular plywood buildup or glued to the plywood as a pressed panel, the surface it creates has high finish, decorative appeal, and is highly resistant to abrasion, water, and solvents.

An endeavor has been made to point out some of the broader aspects of low-pressure laminating, its materials, methods, and applications. No attempt has been made to catalog in its entirety the various phases of this field, but it is hoped enough of the picture has been presented to give an idea of its potentialities and the contributions that the paper industry has made in this most intriguing enterprise.

Establishes Service Plan

Recognizing the long years of continuous service of the men and women at the Philadelphia Quartz Company, Philadelphia, Pa., manufacturer of silicates of soda, Thomas W. Elkinton, president, recently announced at an employees' dinner a new service emblem plan.

All employees associated with the company for 10 years or over will receive silver or gold pins or buttons designating specific periods of service. The emplem is patterned from the company initials, P.Q., the Q forming the outside border. The emblem for 10-year employees are silver, and gold emblems are used for each succeeding five year period. For 25, 30, 35 and 40 years, jewels are added. Top honors were bestowed on John A. Wilson, construction superintendent, for his record of 42 years. Fifty-five employees have been with the company for over 25 years.

Those now eligible represent all departments of the company at its general office in Philadelphia, Chicago Sales office, Chester (Pa.) Laboratory, and all of its 9 plants; Anderson, Ind., Baltimore, Md., Buffalo, N. Y., Chester, Pa., Kansas City, Kans., Jeffersonville, Ind., Rahway, N. J., St. Louis, Mo., and Utica, Ill. Records of 15 years or longer have been achieved by 36% of the plant employees and 34% at the offices.

Exports Increase in Value

From Ottawa it is announced that Canadian exports of wood and paper in the first 11 months of this year were valued at $405,164,000, as compared with $353,847,000 in the like period last year. Of this amount newsprint accounted for $145,011,000 as compared with $131,195,000 for the eleven months to the end of November, 1943.

Viscosity and Molecular Weight*

IV—Acid and Basic Methods

By S. Coppick[1]

Abstract

A comparative study is made of the various methods for determining the solution viscosity of wood pulps. These include cuprammonium, cupriethylenediamine, and nitrate viscosities. The molecular magnitude of wood polysaccharide is evaluated from the various solution viscosity data determined at various stages during the purification of wood cellulose.

The results indicate that nitrate viscosities are much more reliable than either of the basic methods for celluloses containing residual lignin. Noncellulosic encrustants interfere with the solution of the polysaccharide to such an extent as to produce an entirely erroneous picture of the degradation which occurs during the purification of wood cellulose.

By suitable calibration the nitrate method for determining the degree of polymerization may be brought into agreement with the TAPPI standard cuprammonium method.

For technical control in the pulp and paper industry, the basic method for viscosity measurement has usually been that where cuprammonium is the solvent. Recent advantages *(22, 23, 9, 10)* in the use of cupriethylenediamine have indicated that this newer and more stable solvent will perhaps soon replace its ammonia analogue.

Many of the recent investigations reported in the literature have indicated *(18, 19, 23)* that basic methods have certain disadvantages. Oxidative treatment of cellulose probably gives rise to dialdehyde or ester groups as demonstrated in Fig. 1. These structures are very unstable in alkaline medium and it has been pointed out *(6, 7)* that in many cases where cellulose has been subjected to oxidizing conditions, viscosity measurements should be made by acid methods. Furthermore, Staudinger *(20)* has suggested that even in native cellulose itself there are some ester groups, so that no cellulose remains unchanged when dispersed in basic solvents.

These considerations have given rise to the use of various nitration procedures to convert cellulose to its nitrate without appreciably affecting the chain length. The viscosity of the resulting nitrate is then determined in organic solvents.

In earlier work *(12, 2)*, it was shown that on direct nitration of wood and pulp, the carbohydrate is nitrated along with the lignin encrustant. Reaction of the ligneous material takes place to such an extent that the oxidation and nitration products are readily removed from the nitrated carbohydrate. This provides an acid method for the determination of viscosities of both raw and well cooked pulps.

Experimental Methods

For a comparison of the applicability of the acid and basic methods to the materials most commonly met with in the pulp and paper industry, the various viscosities were determined for a series of pulps obtained by delignifying wood to various extents. The preparation of these materials has been described in previous work *(13, 3, 4)*.

Cuprammonium viscosities were determined by the standard TAPPI procedure. Two sets of viscosities were measured: (1) TAPPI total viscosity, using 1 gram of moisture-free pulp per 100 ml. of solvent and (2) TAPPI lignin-free viscosity, where consideration was given to the lignin content of the pulps, so that on the basis of the amount of this encrustant present, solutions of the pulps were prepared so as to give 1 gram of carbohydrate per 100 ml. of solvent.

From these viscosity data the apparent value of the degree of polymerization was determined by calculation of the intrinsic viscosity *via* Fikentscher's *(8)* method:

$$\frac{\ln \eta_r}{c} = \frac{75\,K^2}{1 + 1.5\,Kc} + K$$

$$\text{so that} \quad [\eta] = 75\,K^2 + K$$

and evaluation of the chain length from Kraemer's *(14)*: D.P. $= 260\,[\eta]$. This method was discussed in detail in earlier work *(3)*, and it has been further described by Meyer *(17)*.

For the cupriethylenediamine viscosities, the method of Straus and Levy *(21, 22)* was used. The polymerization function was evaluated from viscosity measurements at 0.5% concentration *via*:

$$\frac{\log \eta_r}{c} = \frac{S}{1 + 0.3\,c + 0.005\,Sc}$$

and D.P. $= 2.3\ (260\ S)$ as used by the originators *(21, 22)* of the cupriethylenediamine method.

The viscosities of the extracted and further purified *(4)* wood carbohydrate nitrates were evaluated by a method which was described in previous work *(3)*. Viscosities were determined at concentrations of 0.285 grams per ml. of mixed solvent and converted to the polymerization function *via*:

$$\text{D. P.} = 260\,\frac{\ln \eta_r}{c}\,(1 + 0.5\,c)$$

which was developed and reported in a previous paper *(3)*.

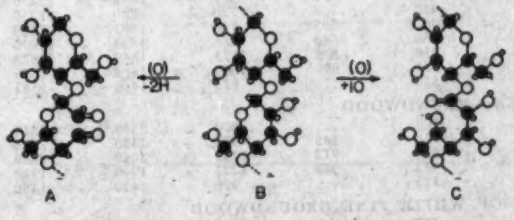

FIG. 1
Schematic Representation of the Possible Oxidation Products of Cellulose Which Are Unstable in Alkaline Media

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 14-17, 1944.

[1] Member TAPPI; Acting Professor of Forest Chemistry, Pulp and Paper Dept., New York State College of Forestry, Syracuse, N. Y. Present address, National Research Council Project 29, Q. M. C., Columbia University, New York, N. Y.

Results

The results are given in Table I and Figs. 2, 3, and 4. It is apparent that the acidic methods are applicable over a far greater range of lignin contents than are the basic methods. In the cuprammonium and cupriethylenediamine solvents, lignin apparently interferes with the solution of the polysaccharide to such an extent, so that the degradation which occurs during cooking is "masked" by the greater and greater amounts of cellulose which go into solution in the basic solvent as the lignin is removed. This results in an apparent increase in viscosity as delignification proceeds, which is an obvious fallacy. In the sulphate and soda cooks it appears that the basic methods may be valid for lignin contents below 5%, while with the chlorine dioxide delignifications there is no indications that even 2% lignin is permissable for an accurate evaluation of the solution viscosity.

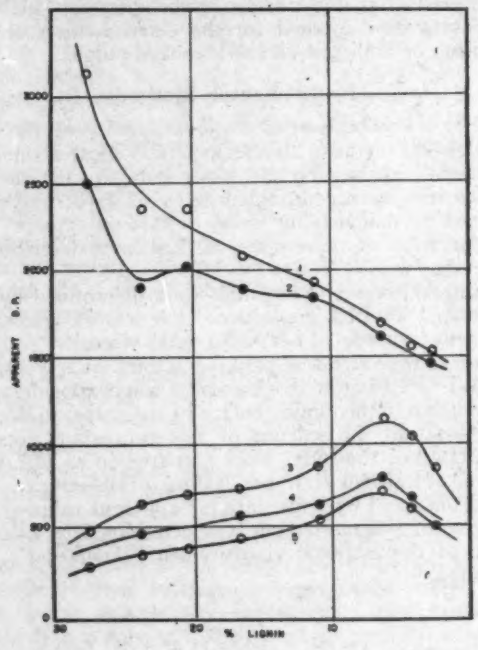

FIG. 2

Apparent Changes in the Average Degree of Polymerization of the Carbohydrate in Wood During Its Isolation by the Sulphate Process, as Determined via: 1—Purified Nitrate Viscosity. 2—Crude Nitrate Viscosity. 3—Cupric Ethylenediamine Viscosity. 4—Lignin Free Viscosity. 5—Total Viscosity

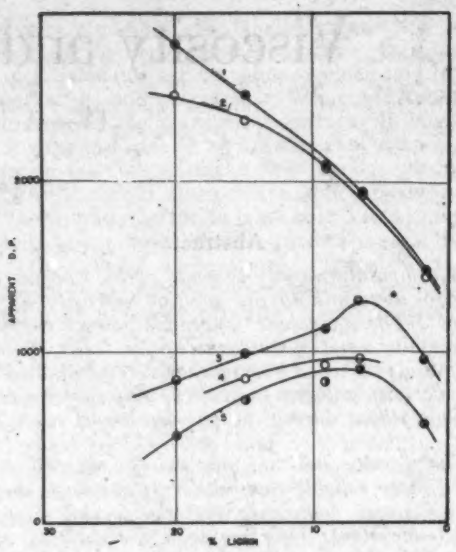

FIG. 3

Apparent Changes in the Average Degree of Polymerization of the Carbohydrate in Wood During Its Isolation by the Soda Process, as Determined via: 1—Purified Nitrate Viscosity. 2—Crude Nitrate Viscosity. 3—Cupric Ethylenediamine Viscosity. 4—Lignin Free Viscosity. 5—Total Viscosity

The acid methods give results which are more in keeping with recognized ideas regarding the degradation of cellulose during its isolation from wood. The crude nitrate gives values which extend the range of viscosity application up to 10% lignin, while the purified nitrate may be used over the whole range of original wood to well cooked pulp.

Polymerization Relationships

The values for the degree of polymerization which have been obtained for these nitrates are, however, considerably greater than those obtained by the basic methods. These discrepancies may arise from the direct use of Kraemer's *(14)* constant for cellulose nitrate in acetone, while actually the viscosities were determined in an acetone-alcohol-benzene mixed solvent. Kraemer *(14)* has shown that the intrinsic viscosity is practically independent of the solvent, but contrary to this Mark's *(15)* results indicate that by mixing solvents one changes the intrinsic viscosity considerably. It appears that solvent-solute inter-

TABLE I

Lignin %	TAPPI Viscosity (Total) 1% cps.	TAPPI Viscosity (Lignin Free) 1% cps.	$Cu(En)_3(OH)_2$ Viscosity (Total) 0.5% cps.	Nitrate Relative Viscosity 0.285% Apparent	Nitrate Relative Viscosity 0.285% Actual	Degree of Polymerization: D. P. From TAPPI Total Viscosity	From TAPPI Lignin Free Viscosity	From $Cu(En)_3(OH)_2$ Total Viscosity	From Nitrate Apparent Viscosity	From Nitrate Actual Viscosity
SULPHATE DIGESTIONS OF WHITE PINE GROUND										
27.4	4.69	....	2.71	10.1	19.2	315	....	515	2490	3110
23.7	5.83	8.22	3.53	7.2	8.6	380	490	675	1895	2350
20.4	6.76	....	3.77	7.8	8.7	410	....	720	2200	2350
16.7	7.51	11.40	3.78	5.4	7.6	460	595	720	1895	2180
11.1	11.00	13.42	4.80	5.1	5.9	580	640	865	1855	1970
6.5	18.17	21.78	8.15	4.0	4.3	750	808	1175	1610	1670
4.5	13.61	15.54	6.91	3.8	3.8	645	690	1080	1565	1565
3.0	9.29	....	4.90	3.4	3.8	530	....	875	1460	1565
SODA COOKING OF ASPEN GROUNDWOOD										
20.0	8.61	....	4.47	10.1	14.1	505	....	820	2510	2810
15.0	16.43	24.5	5.94	8.9	10.4	710	845	990	2380	2510
8.9	23.46	30.71	7.63	6.4	6.5	830	912	1135	2050	2060
6.6	30.21	34.4	10.37	5.6	5.7	918	962	1325	1940	1940
1.8	9.13	....	5.56	3.3	3.5	525	....	950	1430	1480
CHLORINE DIOXIDE DELIGNIFICATION OF WHITE PINE GROUNDWOOD										
27.4	4.69	....	2.71	10.1	19.2	315	....	515	2480	3090
25.6	4.40	7.30	2.69	12.5	18.5	295	450	510	2700	3050
17.5	9.80	15.05	5.06	21.4	30.9	548	685	900	3080	3550
7.7	12.23	22.5	9.28	15.8	18.4	765	820	1250	2920	3050
1.7	118.1	....	20.33	9.0	9.7	1385	....	1740	2380	2430

action enters into the picture so that: D. P.$=k\ [\eta]^a$ where k and a are constants depending upon the system and include not only the species of the polymer but also the solvent, degree of substitution, temperature, etc. It is only in several rare cases that the linear relationship is valid so that: D. P.$=k'\ [\eta]$ Hence all viscosity relationship with D. P. is empirical, and for each system the viscosity must be calibrated with the D. P. determined by absolute methods such as osmotic pressure, light scattering, or the ultracentrifuge.

Since Kraemer *(14)* has calibrated the cuprammonium viscosity function with ultracentrifuge measurements of the molecular weight, the cuprammonium D.P. values may be used as an intermediate standard for calibrating the system of nitrates in the mixed solvent. In any case, irrespective of which method is considered to give the correct values, it is advisable to bring the various methods into agreement so that they may be compared on an equal basis.

Calibration of the Nitrate Method

For this calibration both cuprammonium and nitrate viscosities have been determined for several purified celluloses obtained by bleaching kraft pulps. Here, there is no interference due to lignin or other noncellulosic material. The results of this calibration are shown graphically in Fig. 5.

It seems that the apparent D.P. derived for the nitrates bears a linear relation to the D.P. determined *via* cuprammonium solution viscosities. Furthermore, this straight line, agrees very well with values obtained by Heuser *(11)*. A sample of raw cotton was nitrated and evaluated, while a sample of the same material was investigated by the Institute of Paper Chemistry. This relationship reduces the various methods to a common basis. The relation of the apparent D.P.$_A$ of the nitrate to the D.P. of the original cellulose is given by the slope and intercept of Fig. 5.

$$\text{D. P.} = 0.62\ (\text{D. P.}_A - 500)$$

Thus the viscosities of the nitrate may be related to the degree of polymerization either by use of this plot or by inserting these constants into the original equation *(3)*, so that:

$$\text{D. P.} = 167\ \frac{\ln \eta_r}{c}\ (1 + 0.5\ c) - 310$$

where the relative viscosity is that determined for the nitrate derivative in the mixed solvent.

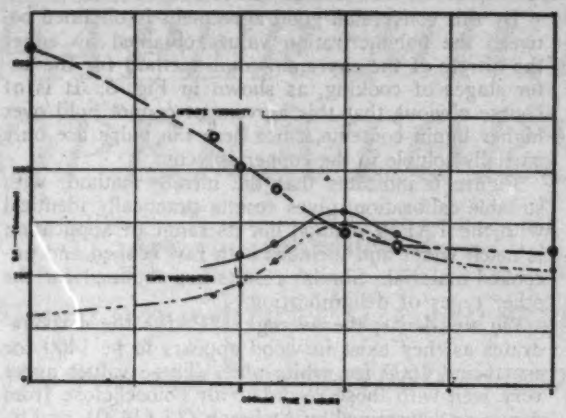

FIG. 6

The Progress of Degradation During Sulphate Pulping as Determined via Purified Nitrate Viscosity, TAPPI Lignin Free and TAPPI Total Viscosity

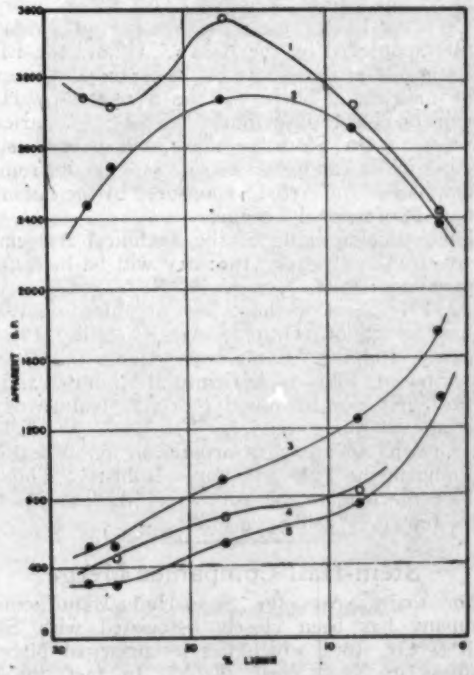

FIG. 4

Apparent Changes in the Average Degree of Polymerization of the Carbohydrate in Wood During Its Isolation by Chlorine Dioxide, as Determined via: 1—Purified Nitrate Viscosity. 2—Crude Nitrate Viscosity. 3—Cupric Ethylenediamine Viscosity. 4—Lignin Free Viscosity. 5—Total Viscosity

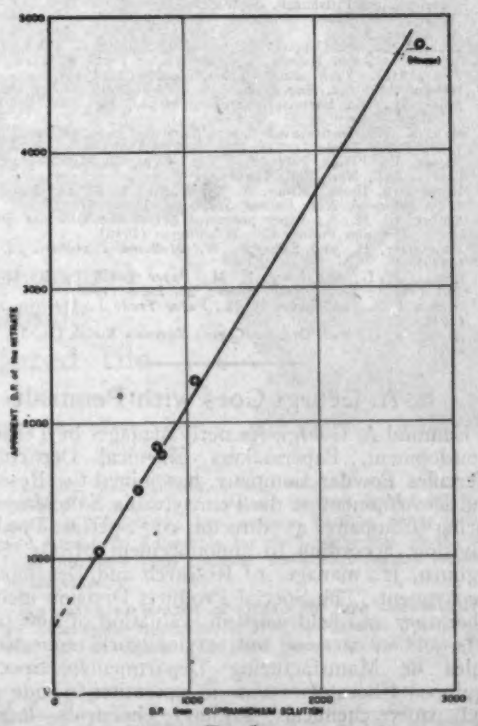

FIG. 5

Calibration of the Apparent Molecular Magnitudes of the Nitrate with Those Determined via Cuprammonium Solution Viscosity of the Original Cellulose

By this conversion good agreement is obtained between the polymerization values obtained by either the nitrate of the cuprammonium method for the latter stages of cooking, as shown in Fig. 6. It is of course obvious that this agreement cannot hold over higher lignin contents, since here the pulps are only partially soluble in the copper solvent.

Figure 6 indicates that the nitrate method, with suitable calibration, gives results practically identical with the TAPPI method but its range of application is much wider and includes both raw cooked and uncooked material. Similar results are obtained for the other types of delignification.

On this basis, the average D.P. for the carbohydrates as they exist in wood appears to be 1400 for aspen and 1600 for white pine. These values agree very well with those recorded for holocellulose from spruce as determined by Atcheson *(1)* (1450), and by Max *(16)* (1425). It should be noted that these pulps have been considerably overcooked, because of the use of defibered material rather than chips. However, the groundwood starting material probably results in pulps of better uniformity.

Acknowledgement

We acknowledge the assistance of J. M. Early in obtaining some of the viscosity data.

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E. A. Georgi Goes with Pennsalt

Edmund A. Georgi, formerly manager of Technical Development, Papermakers Chemical Department, Hercules Powder Company, has joined the Research and Development of the Pennsylvania Salt Manufacturing Company as director of Special Products Division, according to announcement by Dr. S. C. Ogburn, Jr., manager of Research and Development Department. The Special Products Division includes laboratory and field work in evaluation of new products, and in carrying out service work requested by Sales or Manufacturing Departments. Specially equipped laboratories now in operation include pulp and paper chemicals, sanitary chemicals, laundry chemicals, dry cleaning materials, textile processing, detergents, electro-chemicals, ceramics, agricultural chemicals and the special chemicals service laboratory.

TAPPI Notes

Frederick D. Elliott, formerly with the Michigan Research Laboratories, Inc., is now Research Chemist for the Curtis Publishing Company, Philadelphia, Pa.

David H. Dawson has been transferred from the Pigments Department to Assistant Technical Director —Colors, E. I. du Pont de Nemours & Co., 256 Vanderpool St., Newark, N. J.

T. L. B. Young has been transferred from the Three Rivers, Que., mill to be Chief Chemist for the New Brunswick International Paper Company, Dalhouse, N. B.

Glenn C. Kimble, formerly of the Gardner-Richardson Company, is now Research Chemist for the Minnesota and Ontario Paper Company, Minneapolis, Minn.

Holland R. Wemple has recently been elected Vice President of the Texas Gulf Sulphur Company, 75 East 45th street, New York 17, N. Y.

The Watertown Group of the Empire State Section met at the Woodruff Hotel on December 14. Clinton Rector of the Catalin Corporation gave an outline of the history of the plastics industry and George Fromm of the American Cyanamid Corporation spoke on the usage of melamine-formaldehyde and urea-formaldehyde in the paper industry.

The Technical Section of the Canadian Pulp and Paper Association will meet at the Mount Royal Hotel, Montreal, P. Q., on January 24-26, 1945.

The Kalamazoo Valley Section of TAPPI will meet jointly with the Michigan Superintendents Division at the Park American Hotel, Kalamazoo, Mich., at 6:30 P.M., January 11, 1945. E. W. Tinker, executive secretary of the American Paper and Pulp Association will talk on "The Outlook for the Paper Industry in 1945."

The Inter-Society Color Council will meet at the Pennsylvania Hotel, New York, N. Y., on February 23-24, 1945. The technical session on Friday is jointly sponsored by the A.A.T.C.C. and the I.E.C., and will deal with a study of the illuminant in textile color matching. There will be a report by H. L. Logan on "The Distribution of the Primaries in Daylight." On Saturday there will be a business meeting and a discussion session on "Color from the Standpoint of the Artist," sponsored by the American Artists Professional League.

The annual meeting of the Technical Association of the Pulp and Paper Industry will be held at the Commodore Hotel, New York, N. Y., on February 19-22, 1945. Sessions have been organized on Water, Pulp Purification, Graphic Arts, Coating, Plastics, Alkaline Pulping, Containers, Heat and Power, Paper board, Fibrous Agricultural Residues and the Nature of Color in Wood Pulp. A feature of the meeting will be an address by A. G. Natwick of the Crown Zellerbach Corporation on Vocational Training in the Pulp and Paper Industry. This will feature the outstanding success of the paper school at the Camas, Washington mill.

Stein-Hall Companies Merge

For many years the Stein-Hall Manufacturing Company has been closely associated with Stein, Hall & Co., Inc., which has its principal place of business in New York, N. Y. In fact, the two companies have been operated substantially under the same management. It has been decided, therefore, for the purposes of more effctive operation to combine this company with the New York company.

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New York Paper and Pulp Market Review

Tight Paper Supply, Contingent On War, With No Improvement Seen In First Quarter—Pulp Allocations For 1945 Little Changed From 1944—More Waste Paper Needed—Cotton Cuttings Firm.

Office of the PAPER TRADE JOURNAL,
Wednesday, January 3, 1945.

Demand for paper continues substantially in excess of supply, with wrapping, bag and paper board in tighter supply. No improvement can be looked for until all-over government requirements can be reduced. Pulpwood receipts are relatively high but not sufficient to meet increasing needs. More wood pulp must be withheld from paper production for civilian use to meet requirements for more pulp for nitrating, nylon, and for other government uses. The prospect is rather discouraging for the home front, but is dictated by the stern necessities of war. Reports from many manufacturers' representatives, jobbers, and general paper merchants, reflect the handicaps they are experiencing, but indicate the trade is properly evaluating the difficult situation.

The essential character of paper and paper products is now so firmly established, that a reversal of the former supply situations in steel plate for cans, and paper. Cans for packaging are now reported in larger supply than container board. Production of container board increased 5.5%, and tube stock increased 58.7% in the ten-month period of 1944, over 1943.

The index of general business activity declined to 139.6 for the week ended December 23, from 148.2 for the preceding week, compared with 243.2 for the corresponding week last year. The index of paper board production was 149.5, compared with 153.3 for the preceding week, and with 142.2 for the corresponding week last year.

Paper production for the week ended December 23 was estimated at 83.8%, compared with 68.6% for 1943, with 60.0% for 1942, with 79.3% for 1941, and with 61.4% for the corresponding week for 1940.

Paper board production for the week ended December 23 was 94.0%, compared with 87.0% for 1943, with 72.0% for 1942, with 76.0% for 1941 and with 48.0% for the corresponding week for 1940.

The OPA increased by Amendment No. 6 to MPR 450, on January 1, 1945, ceiling prices of lightweight text papers 10%, at the manufacturing level. The increase can be passed on by wholesalers to printing concerns, the agency states.

Wood Pulp

Wood pulp allocations for the first 1945 quarter are about the same as in the last quarter of 1944, to produce a minimum 4,401,963 tons of paper and paper board. Output of bag and wrapping papers are increased slightly, with small decreases in sack and absorbent papers. Exports were increased 20,000 tons.

Rags

Mill buying of new cotton cuttings is active. The higher grades, such as shirt cuttings and unbleached, are in particularly heavy demand this week. Prices are strong at ceiling levels.

Demand for old white cotton rags is active. Little interest is reported indicated in old blues or in other grades at this date. Prices are at ceilings.

Old Rope and Bagging

Military requirements for good, old Manila rope are as urgent as ever, as supplies are limited and under actual demand. Demand for other grades of old rope is good. Prices are at ceiling levels.

Trading in old bagging showed some signs of renewed activity, but little actual change has been reported in this market at this date. Prices are soft and continue nominal.

Old Waste Paper

Demand for waste paper continues urgent and heavy. More paper stock than formerly required must be found to effect to better raw materials situation. Increasingly heavy demands for wood pulp can be relieved by the use of more waste paper. The Girl Scout's collection campaign which began on October 1 is scheduled to continue indefinitely to accelerate collections.

Receipts for the first ten months of 1944 totaled 5,873,000 tons, compared with 5,027,000 tons for 1943.

Prices on all grades of paper stock are strong at ceiling levels.

Twine

No important change in the twine market has been reported this week. Prices continue firm and unchanged.

E. R. Gay Leaves W.P.B.

WASHINGTON, D. C., January 1, 1945—The resignation of Edward R. Gay, assistant vice chairman for civilian requirements, was announced today by William Y. Elliott, vice chairman for civilian requirements of the War Production Board. Mr. Gay's resignation is effective January 2, 1945, but he has consented to serve in the future as a consultant to the board whenever needed.

Having gone to the War Production Board in June, 1942, Mr. Gay ranks among the first of the many executives who gave up their peace time positions to assist in directing the nation's economy during the war period, WPB said.

His first position with WPB was as chief of the Industrial Programs Branch of the Office of Civilian Supply. Later he became director of the General Commodities Division, in which capacity he served until May 1944, when he was appointed Assistant Vice Chairman for Civilian Requirements.

Before going to WPB Mr. Gay was vice president and director of the St. Regis Paper Company in New York City. Included also among his past experience are the positions of news editor of the New Orleans Times-Picayune and assistant dean of Harvard College.

No appointment will be made to replace Mr. Gay, it was explained. His various supervisory responsibilities will be reassigned among other members of Mr. Elliott's staff.

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, January 3, 1945.

BLANC FIXE—Prices on blanc fixe continue to conform to prevailing levels. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—All-over demand is reported heavy. Production is high and supply and demand is reported well balanced. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lot, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point.

CAUSTIC SODA—Demand very heavy. Production heavy, but under demand. Market continues tight. Prices unchanged. The flake form is currently scarce. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Military and all essential requirements heavy with market reported tight at this date. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—The rosin market reports prices unchanged on some grades this week. "G" gum rosin is currently quoted at $5.79 per 100 pounds, in barrels, at Savannah. "FF" rosin is currently quoted at $5.75 per 100 pounds, in barrels, at New York. Seventy per cent gum rosin size is currently quoted at $6.06 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Demand fair during the current week. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Bagged lots delayed by lack of labor. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market firm. Offerings increase and supply situation is more favorable. Demand continues heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is reported satisfactory for the week. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.85 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at works.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$58.00	@	—
Sheets	66.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*48.00	"	—
Sgl. Mla. Lt. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-130, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
100% Rag Ext. No. 1	$39.10@$46.00	$40.25@$47.25
100% Rag	32.20 " 37.75	33.35 " 39.25
85% Rag	.... "	29.90 " 35.00
75% Rag	23.00 " 27.00	24.15 " 28.25
65% Rag	.... "	22.80 " 27.75
50% Rag	18.70 " 22.75	19.90 " 24.25
25% Rag	16.40 " 20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds	Ledgers
No. 1	$10.55@$12.75	$11.70@$14.25
No. 2	9.65 " 11.75	10.80 " 13.25
No. 3	9.30 " 11.25	10.35 " 12.50
No. 4	8.90 " 10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65@	$15.50
No. 2 Glossy Coated	12.40 "	14.00
No. 3 Glossy Coated	11.60 "	13.25
No. 4 Glossy Coated	11.15 "	12.75
No. 1 Antique (watermarked)	10.25 "	11.75
No. 2 Offset	9.60 "	11.00
A Grade E. F.	9.35 "	10.75
A Grade S. & S. C.	9.60 "	11.00
B Grade E. F.	8.85 "	10.25
B Grade S. C.	9.10 "	10.50
C Grade E. F.	8.55 "	9.75
C Grade S. C.	8.80 "	10.00
D Grade E. F.	8.25 "	9.50
D Grade S. & S. C.	8.50 "	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00@ 82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	72.00
Unbl. Soda	68.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

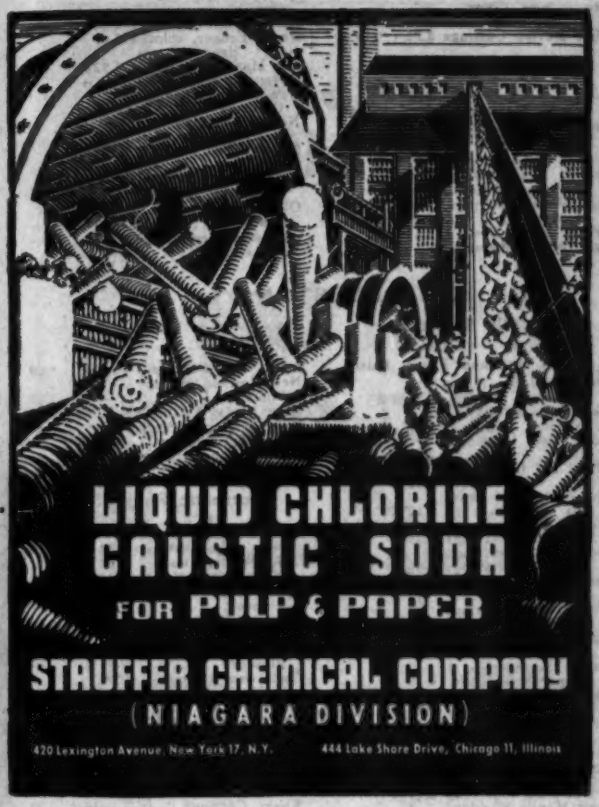
Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.



LIQUID CHLORINE
CAUSTIC SODA
FOR PULP & PAPER

STAUFFER CHEMICAL COMPANY
(NIAGARA DIVISION)

420 Lexington Avenue, New York 17, N.Y. 444 Lake Shore Drive, Chicago 11, Illinois

KOSMOS—DIXIE
PARIS
BLACKS

Unexcelled carbon black pigments for all types of paper and board stocks.

Outstanding for soft texture, particle fineness, and jet black color.

Best for performance in the Beater and Jordan because of ease of wetting and ready dispersion in the pulp.

Takes well to the fiber and shows high retention.

UNITED
CARBON COMPANY, INC.
Charleston, West Virginia
New York Akron Chicago

QUALITY
FOURDRINIER
WIRES
for the Paper Industry
Since 1903

THE LINDSAY
WIRE WEAVING COMPANY
14001-14299 ASPINWALL AVE.
CLEVELAND 10, OHIO

Lindsay WIRES
FOR PAPER MILLS

THE HERMANN CLAFLIN
CONTINUOUS BEATER & REFINER
FOR
ECONOMICAL STOCK PREPARATION

—:—

Numerous installations have proved its ability to improve quality and with a substantial saving in power.

—:—

Adaptable for refining knots and screenings. Continuous and closed systems.

—:—

The Hermann Claflin is built in two sizes at the present time. Large capacity No. 3 ready in near future.

—:—

Operated at Conventional Jordan R.P.M.

—:—

THE HERMANN
MANUFACTURING CO.
Also Mfg's. Sheet Making-Pulp Testing Apparatus
LANCASTER, OHIO

Old Rags

White, No. 1—			
Repacked	*2.90	@	—
Miscellaneous	*2.90	@	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	3.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign		"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.30	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila		"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03½
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¾
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.00	"	—
Miscellaneous No. 1	2.90	"	—
Miscellaneous No. 2	2.65	"	—
White No. 4—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	1.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
No. 1 Clean bright—			
Sisal Strings			.04
No. 2 Clean bright—			
Sisal Strings			.03
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.35
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.31
No. 1 New Lap:			
Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings			
Mixed	2.15		
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½		
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	
Kraft Corrugated Cuttings	2.25	"	
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	—	@	2.50
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	—	"	1.35
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Car Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	2.75
South American	—	"	3.00

Wool Tares—			
Foreign	(nominal)		
Domestic	4.25		
Aust. Wool Pouches	—	"	3.00
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04¼	@	.04½
Fancy Percales	.04¼	"	.05
New White No 1	.06¼	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¼	"	.06½
Underwear Cutters, Unbleached	.05¼	"	.06
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06½
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03½
Corduroy	.03¼	"	.03¾
New Canvas	.06½	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.00	@	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	1.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65		
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

Price & Pierce Ltd.

WOOD PULP & PAPER AGENTS

for domestic and export

60 East 42nd Street, New York 17, N.Y.

West Virginia Pulp and Paper Company

230 Park Ave. New York
35 East Wacker Drive Chicago
Public Ledger Building Philadelphia, Pa.
503 Market St. San Francisco, Cal.

Manufacturers of

ENGLISH FINISH SUPERCALENDERED
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2—2000 lb. Iron Tub Beaters—Beater Rolls 60" Face x 56" Diameter—Tubs 10'8" Wide x 23' Long—Pulleys 80" Diameter x 21" Face.
3—1,000 lb. Dayton—iron tub beaters.
2—400 lb. Gavit—iron tub beaters.
1—1200 lb. Dayton Globe Iron Tub Beater.

CALENDER STACKS

1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—77" 2-roll—Moore & White.
1—86" 5-roll—Black-Clawson.
1—72" 5-roll—rolls newly ground and in excellent condition.

CENTRAP

1—Shartle Brothers Centrap—very good condition—used 6 months additional data furnished on application.

CYLINDER MOULDS

1—Cylinder Mould—48" Diameter x 96" Face (Improved Paper Machinery Co.)—excellent condition.
8—30" diameter x 72" face.
3—30" diameter x 74" face covered with monel facing wire.
2—36" diameter x 118" face.
1—30" diameter x 71" face.
1—36" diameter x 90" face.

DIGESTER

1—18 ft Globe Rotary Digester. Dismantled and match marked ready for shipment.

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3—O. D. James 75 H.P. Speed Reducers with couplings and motor bases. Ratio 2.16 to 1. 900 RPM to 418 RPM.

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18—Dryers—36" Diameter x 94" Face—complete with 2-deck Frames, Gears, Bearings, Piping and Drive.
1—Dryer—48" Diameter x 94" Face.
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2—36" x 44" face—with frames and bearings (6" diameter journals).
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
3—36" diameter x 116" face.
2—28" diameter x 65" face.

ERKENSTATORS

3—I. W. E. Erkenstators—bronze construction—complete with motors, starters and distributing box.

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1—600 ton Dunning & Boschert hydraulic Pulp Baling Press—low and high pressure hydraulic pump, valves, piping, etc. —Platen 38" x 38" — ram 20" diameter —daylight 50"—stroke 36".
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1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).

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1—Allis Chalmers slip ring motor—200 H.P. —3 phase, 60 cycles, 440 volts—505 R.P.M.—with starting equipment.
2—Westinghouse Motors — 50 H.P. — 865 R.P.M.

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1—45" Black-Clawson paster.

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1—Eaton, Cole & Burnham Company pipe threader—2" to 8"—complete with dies.

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1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary Incinerators—9' diameter x 20' long.

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1—#2 Lannoye Pulper.
2—#2 Jones Pulpers—direct connected to 60 H. P. motors—3 phase, 60 cycle, 440 volts—forward and reverse starting.

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1—2 Bowl Reel — 112" face — bowls 20" diameter.

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500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

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29—Cut .035.
3—Cut .065.

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1—72 3/4" Face x 9" diameter (soft rubber).

SAVEALLS

2—#5 Bird Savealls.
1—North Save-all—cylinder mould 72" diameter x 100" face—used less than one year.

SHREDDERS

1—Jeffrey swing hammer type shredder—size 24" x 18"—antifriction bearing equipped.
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.

SHEETERS

1—103" Hamblet Single Knife Sheeter—complete with Slitting Device and Drive.
1—110" Horne single knife rotary sheet cutter.

SLITTERS

1—42" Cameron Slitter & Winder with mill roll stand for 30" diameter rolls. Will rewind 30" diameter.
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1—110" Beloit slitter (slitter attachment only) excellent condition.
1—114" Two drum Kidder slitter and winder.
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SUCTION BOXES

1—Nash 100" face Suction Box—Practically new—In operation less than 1 year.
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3—Brass Suction Boxes—96" long x 9" wide.
2—Brass Suction Boxes—85" long x 8 1/4" wide.

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1—Sandusky Suction Couch Roll—18" diameter x 130" face—Complete with Sturtevant Vacuum Pump and drive mechanism.

SUCTION PRESS ROLLS

1—Sandusky suction press roll, Bronze—14 1/4" diameter x 77" drilled face.

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1—22" diameter x 118" drilled face.
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1—18" diameter x 94" drilled face.

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Works Manager paper converting plant
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Superintendent rag content paper mill
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Assistant superintendent, straw box boards
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Plant engineers, chief engineers, master mechanics, draftsmen and designers
Superintendent folding box board, roofing papers and felt mills
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We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. J-4

HERE IS A JOB WITH A FUTURE FOR AN EXPERIENCED BAG ADJUSTER

This up-and-coming New York City Company needs a crack paper bag adjuster to handle battery of flat and square machines. Excellent postwar opportunity. Steady work. State salary requirements and complete information in your first letter. Box 45-7 care Paper Trade Journal. J-11

HELP WANTED

WANTED—SALESMEN

for wax paper printed or unprinted and other kindred lines. Good territory open, good leads and a factory backed by an organization and personnel long in the field. If you are not satisfied with your present post war outlook write us in confidence. We are looking for that exceptional man who is familiar with the requirements of the baking and industrial trade and one who has had experience and aggressive sales knowledge. State age, education, experience, etc., in the first letter. Address Box 44-858 care Paper Trade Journal. J-4

ENGINEERING DRAFTSMAN for Post War Design and Development Paper Mill Machinery. Experience in Paper Mill Equipment Design Helpful. Location Northern New Jersey. State experience. Certificate availability necessary. Write Box 44-527, Paper Trade Journal, 15 West 47th St., New York, 19. N. Y. TF

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Position open in post war program of established company to call on paper and textile mills as salesman and technician, to sell and demonstrate chemical products. Prefer chemical or mechanical training—under 35 years old. Salary would depend on qualifications and experience. State full particulars as to age, nationality, education, experience and family status. Address Box 44-880 care Paper Trade Journal. J-18

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ENGINEERS and DRAFTSMEN experienced in pulp and paper mill design and process by Consulting Engineers. Address Box 44-809 care Paper Trade Journal. T.F.

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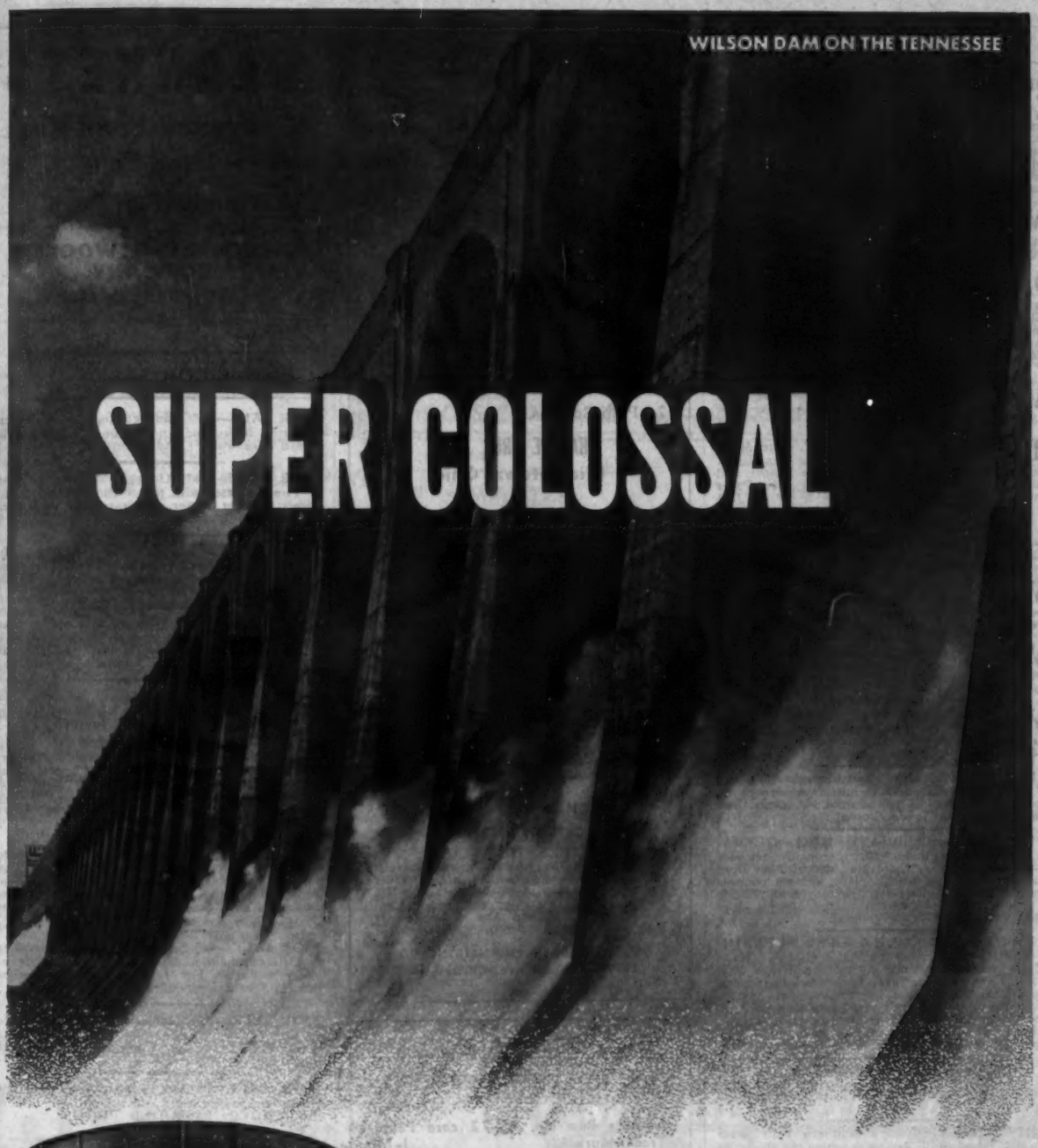
WANTED—Cylinder Machine Superintendent for modern Southern Kraft Mill. Address Box 44-888 care Paper Trade Journal. J-4



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Have us explain how this revolutionary piece of equipment pulps an entire bale of mixed papers in the time it takes to fill a pipe.

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Why it pulps so uniformly and so thoroughly.

Why each hydrapulper installed eliminates from 3 to 5 or 6 beaters, freeing beater room personnel for use elsewhere.

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CHEMICAL OR MECHANICAL ENGINEER—Wanted for a senior position in Manufacturing Control in a large Printing and Converting plant in Niagara Falls. Should be college graduate, preferably with Paper Mill or Manufacturing Control experience. Give personal data, experience and salary desired. Apply Dr. John Campbell, Moore Research and Service Company, Inc., Niagara Falls, New York. J-4

WANTED—Paper Mill Mechanics for maintenance and repair work. State experience, age, salary desired. San-nap-pak Mfg. Co., Inc., Rockland, Delaware. J-4

DRAFTSMAN WANTED — Large midwest board mill offers permanent position for an engineering draftsman familiar with paperboard mill equipment, design and operation. Excellent opportunity for man with proper qualifications. State draft status availability and experience. Address Box 44-821 care Paper Trade Journal. J-18

WANTED—Lab. Assistant. Prefer one with some paper mill experience. Address Box 44-887 care Paper Trade Journal. J-11

SALE: PURCHASING AGENT. Age 30 to 40. Having volume Purchasing experience. Post war opportunity. Give complete history and salary desired. Address Box 44-883 care Paper Trade Journal. J-11

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WANTED—Position as Production Engineer. Would consider group of mills. Excellent reputation and references. Address Box 44-831 care Paper Trade Journal. J-11

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WANTED—Position as Plant Engineer. Twenty years practical and technical experience in Paper Mills. Replies confidential. Address Box 44-834 care Paper Trade Journal. J-11

ATTENTION SULPHATE MILL OPERATORS—Man under 40, thoroughly familiar with all phases of sulphate pulp manufacture from wood yard through bleach plant, desires connection in supervisory capacity. Employed at present as superintendent of eastern mill. Address Box 44-856 care Paper Trade Journal. J-4

PRACTICAL MANAGER, SUPERINTENDENT desires to make change. Have had 26 years experience in making Kraft, .009 Straw, Chip, Roofing and Light weight papers. Exceptional background of achievements as to production, quality and plant maintenance. A good organizer. Best of references as to ability. Married. Have family. Address Box 44-879 care Paper Trade Journal. J-18

ASSISTANT MANAGER of large paper firm desires change. Good background, executive ability. Address Box 44-867 care Paper Trade Journal. J-4

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FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

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1—Pusey & Jones two spool, upright reel, 114" wide, slip belt.

1—Bagley & Sewall two spool, upright reel, 79" face.

1—Moore & White two spool, upright reel 79" wide, slip belt.

1—Warren winder 114" face.

2—Four drum Moore & White winders, 116" and 104" face, handle 60" diameter rolls.

7—Pulp Screens.

SHARTLE BROS. CO.
Middletown, Ohio

J-4

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28" and 43" Hamblet single Knife Rotary Shooters; 68" Clark Sheeter with automatic layboy; 110" Hamblet extra heavy mill type Sheeter; 72" six-roll double dock Back-Stand; 68" Rice-Barton Slitter & Rewinder for use in connection with paper making machine; SLITTERS: 34" Inman, 50" Langston, 42" Kidder, 40" S & S.—same as new, 62" Columbian, and 65" Moore & White, 45 x 65 Robinson double Scorer; 44" Seybold and White Automatic Power Paper Cutters; Kidder one and two-color Rotary Web Presses.

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J-11

FOR SALE

1—84" wet machine with automatic skinner

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Guaranteed used steel pipe and boiler tubes
Wood and steel tanks
Buildings, valves and fittings

JOS. GREENSPON'S SON PIPE CORP.
Natl. Stock Yards, St. Clair Co., Ill. M-8

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1—144" Trim Cylinder Machine

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Care Paper Trade Journal

J-11

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Converted From Your Used Felts

Write for Full Details

BLOOMFIELD WOOLEN COMPANY
BLOOMFIELD, IND.

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FOR SALE—65" Hamblet single knife Sheeter, 6-roll back-stand, no layboy. Address Box 44-876 care Paper Trade Journal. J-4

FOR SALE—64" Oswego Automatic Clamp Power Cutter with power back gauge, 5 H. P. Direct Current Motor. Address Box 44-826 care Paper Trade Journal. TF

FOR SALE — 1 - Spur Gear Reducer, type OD-60-22, 75 HP, Ratio 11.54:1, practically new. Frank H. Davis Company, 175 Richdale Ave., Cambridge, 40, Mass. J-4

FOR SALE — 63" Oswego Automatic Clamp Power Cutter with power back gauge and 5 H.P. Direct Current Motor. Address Box 44-881 care Paper Trade Journal. J-4

FOR SALE — Bag Machines, Squares, Flats, Self-opening. Practically all sizes. Address Box 44-890 care Paper Trade Journal. J-4

FOR SALE—1 - Standard Horne Jordan, capacity 18 to 20 tons per 24 hours. 3½" steel fillings. Equipped with flexible coupling for both jordan and motor. Extra Shartle filling for shell and plug. Complete and in good condition. Address Box 45-1 care Paper Trade Journal. J-4

FOR SALE—Noble & Wood Standard Mammoth Jordan, belt driven with ¾" new shell and plug fillings and spare shell and plug filling. Babbitted bearings. Complete and in good condition. Address Box 45-2 care Paper Trade Journal. J-4

FOR SALE—74" Seybold Holyoke Power Paper Cutter, rebuilt and guaranteed. Complete with safety devices. For further particulars address Box 45-3 care Paper Trade Journal. J-4

FOR SALE—Two Noble and Wood Pony Monarch Jordan Fillings, Shartle Manufacture. Inquire Borrows Paper Corporation, Little Falls, N. Y. J-18

FOR SALE — 38" Oswego Automatic Clamp Cutter, fully rebuilt and guaranteed. Address Box 45-11 care Paper Trade Journal. J-4

WANTED

ANNOUNCEMENT

I will purchase any of your used or surplus paper and pulp machinery. Will make immediate inspection on receiving your listings. Pay cash for equipment we purchase.

JACK ROSS
17 Porter Avenue, Newark 8, N. J.
Phone Waverly 3-5675
J-4

WANTED

WANTED

Four or more color Web Aniline or Wall paper Printing Press, 36 Inches or wider. State make, condition and price. Address Box 44-872 care Paper Trade Journal. J-4

WANTED

One (1) Laboratory Beater
Waterbury Hydraulic Drive size 5
11—60" Diameter x 92" Face Dryers
16—48" Diameter x 92" Face Dryers
4—36" Diameter x 92" Face Dryers

with gears, frames, felt rolls and cone pulley drives. Address Box 44-708 care Paper Trade Journal. TF

WANTED

CALENDER STOCK—10" INTERMEDIATE ROLL MINIMUM
ALSO
SHEETER—SINGLE OR DOUBLE CUT-OFF BOTH FOR 72" MACHINE

Address Box 44-728 care Paper Trade Journal. TF

WANTED—Two (2) Jordans—No. 1 or No. 2 Miami or equivalent. Also, two (2) Calender Stacks approximately 100" face. Give complete description and specifications. Empire Box Corporation, Garfield, New Jersey. J-11

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 60 NORTH MAIN ST., NATICK, MASS. TF

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 44-835 care Paper Trade Journal. tf

WANTED TO PURCHASE—Paper mill in operation. Can pay all cash. Large successful mill preferred. Confidential. Address Box 44-770 care Paper Trade Journal. TF

WANTED—1 - #2 Miami Jordan Plug with or without shaft; 1 - Cylinder Mould 60" diameter, 60" face; 1 - Finishing Calender 7 or 9 roll 60" to 66" face. Address Box 44-868 care Paper Trade Journal. J-11

WANTED—Any Item of Paper Tube and Paper Can Machinery, Slitters, Tube Winders, Cutters, etc. etc. We will buy such machinery in any condition. Theo. Adams, 111 W. Washington St., Chicago, 2, Ill. TF

FOR SALE

FOR SALE

FOR SALE

One complete 98" Fourdrinier and auxiliaries, specifications as follows:—

1—Moore & White Co. 98" Fourdrinier Paper Machine (Wire 70' Long x 98" Wide).
3—Sets of Presses.
1—18" Diameter Suction Couch Roll (Sandusky).
1—150 H.P. General Electric Co. motor and starter, driving the wet end of this machine.
25—Dryers—48" Diameter x 98" Face (2 desk).
1—Baby Dryer—36" Diameter x 98" Face.
1—Bottom Felt Dryer—36" Diameter x 98" Face.
1—Top Felt Dryer—36" Diameter x 98" Face.
1—4-Roll Calender Stack.
1—2-Bowl Reel.
1—2-Drum Moore & White Co. Slitter and Winder.
7—1000 lb. Beaters (Noble and Wood Machine Co.).
1—200 H.P. motor and starter (3 phase, 60 cycles, 440 volts), driving line shaft for these beaters.
1—Motor driven Mammoth, Jr. Jordan (Noble and Wood Machine Co.).
3—10-plate Sandy Hill Flat Screens (Packer type), Witham Fasteners.
2—Sets of spare screen plates for the above Flat Screens.
1—Ames Twin Variable Speed Engine, from 30 to 200 H.P.
1—New bottom dryer felt—72 yards long x 98" wide.
1—New top dryer felt—78 yards long x 98" wide.
7—New Wet End felts—60' long x 100" wide.
1—New Fourdrinier Wire—70' long x 90" wide (80 mesh).

In addition to the above, we have available all the line shafting, piping, spare rolls, drives, stock chests, agitators, etc.
The above described machine is in excellent condition, having been in operation approximately three years on experimental work—presently on original foundations and can be seen in actual operation. Photos on request.

J. J. ROSS COMPANY, 250 Frelinghuysen Avenue, Newark 5, N. J. J-4

WANTED

WANTED—Several 1,000 lbs. beaters, in good condition, fly bars ⅜ inch or ½ inch thick. Keyed type rolls. Address Box 44-891 care Paper Trade Journal. J-4

WANTED—One 56" and one 64" trim modern Cameron or Langston winder with slitting attachment just before the paper is wound on the roll. Give full description and price. Address Box 45-5 care Paper Trade Journal. J-25

MACHINE TIME AVAILABLE on modern lacquer coating machine limited to 40" widths. Competent supervision. Trade work solicited. Location—Midwest. Address Box 45-6 care Paper Trade Journal. J-4

WANTED — Jones No. 1 high speed, roller bearing equipped Jordan. Address Box 45-10 care Paper Trade Journal. J-4

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Enterprising London paper agents, having closest connections with leading paper merchants, importers and converters in Great Britain, the Colonies and the European Continent, desire to contact U. S. mills and exporters with a view to representation.

Address Box 44-815 care Paper Trade Journal. J-11

BUSINESS OPPORTUNITY

WANTED TO HEAR from parties interested in purchasing interest or control in large very successful pulp and paper mill. Confidential. Address Box 45-9 care Paper Trade Journal. J-11

SALES AGENCY

A serious French company is looking to make contact to act as sales representative in France for manufacturers of newsprint, wrapping and printing papers.

If you are interested in post war export business to France, please get in touch with Box 44-875 care Paper Trade Journal. J-11

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of Perforated Metal
The Harrington & King PERFORATING Co.
5652 Fillmore St., Chicago 44, Ill. 114 Liberty St., New York 6, N. Y.

GEIGY
DYESTUFF MAKERS SINCE 1859
Represented in U. S. and Canada by GEIGY COMPANY INC.
39-91 Barclay Street, New York New York
BRANCHES
Boston, Providence, Toronto, Philadelphia, Charlotte, Cincinnati, Portland, Ore.

PULP MILL MACH'Y FINISHING ROOM MACH'Y
FRICTION CLUTCHES
MOORE & WHITE CO.
PHILADELPHIA, PA.
PHILA. STA. PENNA R.R.

DEINKING — DECOLORIZING
K-121-B and K-C-2
COOKING PROCESSES
THE KINSLEY CHEMICAL COMPANY
12500 Berea Road Cleveland, Ohio

FOR 40 YEARS REDUCING STEAM COSTS IN PAPER MILLS
Stickle
STEAM SPECIALTIES COMPANY
2245 VALLEY AVENUE • INDIANAPOLIS, INDIANA

WHERE TO BUY

ABRASIVES
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Monsanto Chemical Co.
Norton Co.

ADHESIVES
Arabol Mfg. Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
The Norwood Engineering Company
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

BAG MACHINES
Thomas W. Hall Co., Inc.
Pondevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Bantam Bearings Division, The Torrington Company
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co.
Montague Machine Works
Rollway Bearing Co.
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company
Valley Iron Works Co.

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.

CALENDERS
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
The Norwood Engineering Company
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
The Frederick Iron & Steel Co.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Smith & Winchester Mfg. Co.
Traylor Engineering & Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Aktivin Corporation
Amer. Cyanamid & Chem. Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali Co.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
The Neville Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Oakite Products, Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnetic Mfg. Co.
Valley Iron Works Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Moore & White Co.
Pondevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
W. R. Cliffe
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierk, Inc.
The Kohler System Company
L. I. M. E.
Merritt-Chapman & Scott Corp.
Main, Inc., Chas. T.
O,Donoghue, Roderick
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elixman Paper Co.
Sonoco Products Co.
Radney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
The Frederick Iron & Steel
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Mfg. Co.
T. B. Wood's Sons Company

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
The Norwood Engineering Company
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.
O'Donoghue, Roderick

DIGESTERS
The Biggs Boiler Works Co.
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric & Manufacturing Company

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
W. A. Jones Fdy. & Mch. Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric & Manufacturing Company

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Traylor Engineering & Mfg. Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Merrick Scale Mfg. Co.
Leeds & Northrup
Traylor Engineering Co.
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Astea-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Pitchburg Duck Mills
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Stauler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
International Pulp Co.
W. H. Loomis Talc Corp.
Union Talc Co.
Vanderbilt Co., R. T.
Wishnick-Tumpeer, Inc.

FILTERS
Moore & White Co.
The Norwood Engineering Company
J. O. Ross Engrg. Corp.
Worthington Pump & Mchy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Kemp, W. F., Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Robinson, C. P.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Covel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machinery Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones &Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
M. P. Bowsher
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.
Westinghouse Electric & Manufacturing Company
Wilkens-Anderson Co.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
Tide Water Associated Oil Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Gaulard-Plahn Co.

MIXERS
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric & Manufacturing Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
The American Rolling Mill Co.
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
The Norwood Engineering Company
Perkins & Son, Inc., B. F.

PLATES
The American Rolling Mill Co.
Black-Clawson Company
Hendrick Mfg. Co.
Klemp, W. F., Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
The Richardson Economy Plug Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

RUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Ingersoll-Rand Co.
Johnson Corp.
Lombard Governor Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimbey Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
The Norwood Engineering Company
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Behr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric & Manufacturing Company

RESINS
American Cyanamid & Chemical Corp.
The Neville Company
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg., Co.
Noble & Wood Machine Co.
The Norwood Engineering Company
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Merrick Scale Mfg. Co.

SCREEN PLATES
Pitchburg Screen Plate Co.
Mosey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Socony-Vacuum Co.
Philadelphia Quartz Co.

SIZING PROCESSES
National Oil Products Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Johnson Corp.
Bartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
Acme Steel Co.
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric & Manufacturing Company.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt

J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
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[PUMP TIPS FROM ALLIS-CHALMERS—ONE IN A SERIES]

How to make SHAFTS Last Longer . . .

The Allis-Chalmers "Electrifugal" Pump is a unit-designed pump . . . with both impeller and motor mounted on one shaft and in one frame. The next time you need new pumps . . . look into the extra efficiency, ruggedness and long life of Allis-Chalmers centrifugal pumps . . . the "Electrifugal" . . . and all types for every purpose.

WHERE YOU HAVE an Allis-Chalmers "Electrifugal" Pump . . . shaft and rotor pictured at left . . . you don't have an alignment problem—because *both* impeller and rotor are mounted on *one* shaft.

However, many pumps in use today are coupled to a separate motor, and how well the two are aligned has a lot to do with how long the shaft lasts . . . and the pump and coupling too . . . because misalignment starts all three fighting each other!

Here are a few tips which will help you get longer life out of pump shafts:

- See that pump and motor coupling flanges are parallel . . . both vertically and axially . . . and that they are kept that way!
- If misalignment recurs frequently, check foundations, piping, bolted connections.
- In the case of boiler feed or other pumps which reach high operating temperatures, be sure that alignment of motor and pump is checked after *both* have been operating. Otherwise they might develop misalignment from unequal expansion.
- If you haven't done so already, send for your *free* copy of "Handbook for Wartime Care of Centrifugal Pumps". Contains *no* advertising. ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WISCONSIN. A 1767

Tune in the Boston Symphony, Blue Network, every Saturday at 8:30 pm, EWT.

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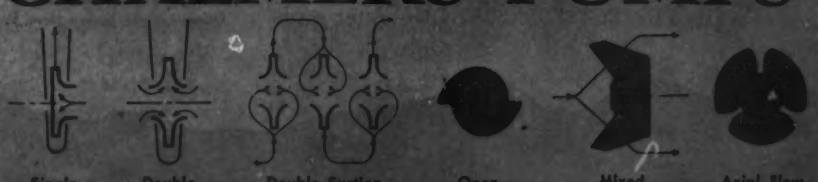
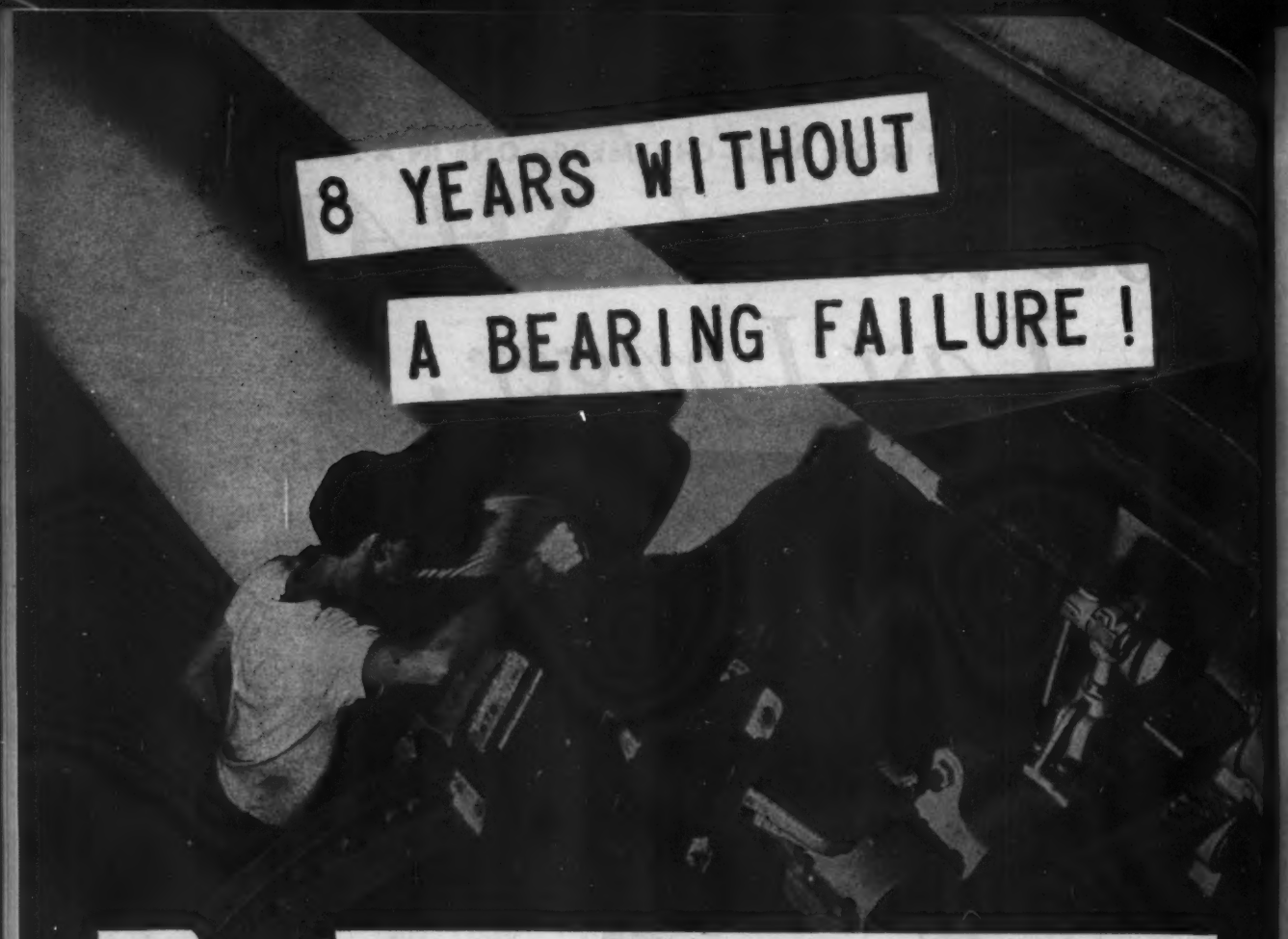
Allis-Chalmers builds all types and variations of pumps shown at right. Capacities from 10 to 150,000 gpm—heads to 2500 lbs.





SUN LUBRICANT...

Solves Lubrication Problem in Special Paper Machine with 60 bearings

An upstate New York paper mill installed a special paper machine, but developed trouble with the bearings of the rollers. High-grade cylinder oil was supplied by wick feed oil cups, but carbon formed, resulting in heavy drag, jerky operation and chronic bearing failures. Also, wicks had to be lifted every time the machine stopped.

CARBON STOPPED when a Sun Engineer recommended an oil with high resistance to oxidation and carbon formation. He also specified an oil which flowed when the machine was in operation, but possessed such qualities that, when the machine stopped, it was not necessary to pull the wicks.

PERFECT LUBRICATION—After eight years of trouble-free lubrication with the new oil and not one burned bearing, the plant superintendent says: "I would not consider any other lubricant under any circumstances—regardless of price."

This story of Sun lubricants is typical of the high quality of Sun products and the "know-how" of our seasoned engineering staff. Sun makes a complete line of oils and greases not only for all types of papermaking machinery, but also for all general industrial equipment, motors, engines, conveyors, etc. We'll be glad to put them at your service.

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